

1925.

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WESTERN AUSTRALIA.

REPORT

OF THE

PUBLIC HEALTH AND HOSPITALS DEPARTMENT

FOR THE

YEARS 1923 AND 1924.

Presented to both Houses of Parliament by His Excellency's Command.

[SECOND SESSION OF THE TWELFTH PARLIAMENT.]

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REPORT OF THE PUBLIC HEALTH AND HOSPITALS DEPARTMENT.

To the Honourable the Minister of Public Health.

I have the honour to present herewith a report upon the work carried out by the Public Health and Hospitals Department during the years 1923 and 1924.

The issue of a biennial report was instituted some years ago as an economy measure, but it is questionable whether whatever value such a report as this has is not prejudiced, at least from a public point of view, by such delay in presentation.

Since the last report was presented, the Factories and Early Closing Branch of this Department has been transferred to the Department of Works and Labour, but so far as the assistance of medical officers is required in connection with health hazards in industry, the Departments will continue to co-operate.

FINANCIAL.

The total expenditure of the Department for 1923 was £184,824, and for 1924, £184,904. The statement following shows in detail how this expenditure has been incurred, as between the separate sections of the Department dealing with Medical and Hospital services, with the provision of Homes for the Aged, and on Public Health. It is noticeable that while the expenditure for both years under review was slightly higher than in 1922, it is still less than the expenditure in 1921, despite the increase that has taken place in the population, in the development of new areas, and the extension of agricultural and other activities.

So far as the Medical Branch of the Department is concerned, the expenditure for 1923 was £151,651, and for 1924 £157,897, compared with an expenditure in 1922 of £147,823.

This increase is entirely due to the opening up of hospitals in newly settled areas and amongst the group settlements. Hospitals were opened in 1924 at Denmark, Northcliffe, Karridale, and Margaret River, and the hospital at Busselton was taken over from the hands of a local committee, which had resigned. The Department had to find subsidies, too, for other hospitals which had been erected and were managed by local committees, and find as well increased subsidies for the larger hospitals of the metropolitan area.

So far as the Public Health Branch is concerned, the expenditure for 1923 was £33,172, and for 1924 £27,007.

It should be noted that in connection with the expenditure and revenue figures of the Public Health section, the Factories administration was removed during 1924 and placed under the Honourable Minister for Labour, so that the above figures while including a sum of £2,500 for Factories administration in 1923 do not make any such provision in 1924.

It should also be noted, under this heading, that there are certain charges included in the expenditure which are not strictly on Public Health. There is the large item, for instance, under the heading of "Government Sanitation." It has been found better, for purposes of convenience and economy, for the Public Health Department to accept the responsibility of organising the sanitary services in respect of all Government buildings throughout the State: sanitary services and sewerage charges are accordingly paid from a vote of the Public Health Department. In 1924 the expenditure on this item was £9,487, but it cannot be regarded as any charge against what is usually regarded as Public Health administration.

Another considerable item of expenditure is in respect of the treatment of cases of venereal disease. The expenditure of the Government under this heading is consolidated in an item under the Public Health section of the accounts, but again, it can hardly be regarded as a proper charge against Public Health administration.

When these items are taken into account, and one also remembers the revenue which is received, it is found that the nett amount spent by this State in the prevention of disease and the care of the public health is in the region of £10,000 per annum, which must be regarded as a very modest sum.

So far as the revenue of the combined Department is concerned, this continues to stand at a high figure, as will be seen in the tables printed hereunder.

In 1919 the total revenue of the Department was £28,840, whereas for the last three years it has been approximately £47,000.

In the table hereunder it will be noted that in 1923 the factory revenue—£1,767 16s. 6d.—was included which is eliminated in 1924, owing to the transfer of the Factories section to the Department of Public Works and Labour.

Excluding the Factory revenue, therefore, there is an increase in receipts, during 1924, of £1,195.

REVENUE.

	1923.	1924.
Medical Branch—	£ s. d.	£ s. d.
Hospital Patients' Fees, etc.	26,003 11 8	27,284 11 7
Payments for maintenance of Inmates of Homes	10,761 16 0	11,432 10 3
Total Medical	36,765 7 8	38,717 1 10
Public Health Branch —		
Licence Fees	358 16 0	344 11 0
Meat Inspection Fees	4,374 11 0	4,067 1 7
"Village Area" Sanitary Contracts	461 4 7	500 9 7
Pathological Laboratory	437 4 8	394 13 11
Sanitation Refunds	438 12 3	105 16 2
Commonwealth Subsidy on Expenditure <i>re</i> Venereal Diseases	2,482 4 3	2,434 10 3
Miscellaneous	514 17 11	363 6 9
Total Public Health	9,067 10 8	8,210 9 3
Fees, Factories Act	1,767 16 6	...
Total Revenue	£47,600 14 10	£46,927 11 1

EXPENDITURE.

The total cost of the various branches of the Department is set out hereunder:—

	1923.	1924.
Medical	£ 151,652	£ 157,897
Public Health	19,403	17,520
Factories	2,500	...
Government Sanitary Services	11,269	9,487
Total Expenditure	184,824	184,904

The following statements show the classification of the expenditure under various main headings:—

	1923.	1924.
MEDICAL BRANCH.	£ s. d.	£ s. d.
Head Office	5,388 2 5	5,827 15 9
District Medical Officers	9,561 19 0	10,047 16 2
Total Administrative Expenditure ...	14,950 1 5	15,875 11 11
Hospitals—		
Salaries	19,015 16 8	21,170 17 2
Maintenance	24,879 8 4	26,848 8 11
Grants to Public and Assisted Hospitals	42,602 18 4	44,578 17 9
Grants to District Nurses	964 18 1	777 19 1
Wooroloo Sanatorium—		
Salaries	9,620 0 3	9,999 8 2
Contingencies and Maintenance	12,222 2 3	11,359 13 6
Wooroloo Farm—		
Wages	1,466 8 6	1,320 15 8
Contingencies	2,810 1 3	2,160 11 10
Total Hospital Expenditure	113,581 13 8	118,216 12 1
Old Men's Home—		
Salaries	6,767 5 5	6,901 14 8
Maintenance	13,345 12 5	13,669 9 3
Women's Home—		
Salaries	749 5 1	806 7 10
Maintenance	2,257 16 4	2,427 13 1
Total "Homes" Expenditure	23,119 19 3	23,805 4 10
Grand Total Expenditure Medical Branch ...	£151,651 14 7	£157,897 8 10
PUBLIC HEALTH BRANCH.	£ s. d.	£ s. d.
Salaries	11,782 16 6	9,716 18 5
Local Health Authorities	22 19 6	...
"Village Area" Sanitation	106 2 9	241 16 5
Fees payable under Health Act	48 16 6	48 2 6
School Hygiene	470 8 7	331 16 6
Travelling and Transport	1,009 12 9	845 8 1
Postage and Telephones	321 18 6	383 19 9
Laboratory	188 18 2	214 7 7
Veneereal Diseases	5,862 5 0	4,521 4 3
Influenza	884 16 2	...
Miscellaneous	1,204 10 4	1,216 10 3
Total	21,903 3 9	17,520 3 9
Less estimated cost of Factories Administration	2,500 0 0	...
Total Public Health	19,403 3 9	...
Sanitation of Government Buildings—		
Wages	309 6 8	212 0 0
Sanitary Charges	10,959 10 4	9,275 1 0
Total Government Sanitation	11,268 17 0	9,487 1 0
Factories Administration	2,500 0 0	...
Total Public Health Branch	£33,172 0 9	£27,007 4 9

GOVERNMENT HOSPITALS.

The schedules showing the salient statistical information regarding the patients treated, the beds occupied, the cost and the collections in respect of each of the Government Hospitals for the years 1923 and 1924, will be found in Appendix "A."

The principal figures may be summarised as follows:—

	1921.	1922.	1923.	1924.
No. of patients treated	4,206	3,877	4,817	5,900
No. of patient days ...	84,278	75,820	86,488	101,217
Average beds occupied	230·9	207·7	236·9	276·5
Cost per patient per day	9/1d.	10/4d.	10/2½d.	9/4½d.
Percentage of Revenue to Cost	35·3	37·6	42·2	45·1

It will be noted that the last two years have shown a considerable increase in the amount of work that the hospitals have been called upon to do. They show, too, a diminished cost per patient per day, and an increased percentage of revenue collections.

At the close of 1924, the Department was managing 24 hospitals and two casualty stations. This represents an increase of five hospitals over the number under the management of the Department when the previous report was issued.

Group Settlement Hospitals.—In order to meet the needs of those placed in relatively distant areas under Group Settlement schemes several new hospitals were opened in 1924.

Karridale.—This hospital was opened on 2nd February, 1924, in premises which were made available by Millar's Timber and Trading Company. The hospital was equipped as a ten-bed institution, and to the 31st December dealt with 82 patients.

At *Northcliffe*, on 16th March, 1924, a hospital was opened in temporary premises. The Group Settlement Department made available first one cottage and then a second cottage, and this temporary accommodation proved very useful until a sixteen-bed hospital was completed, and occupied late in the year. Altogether, at Northcliffe, we dealt with 84 patients during the period under review.

At *Denmark* a hospital was opened on 22nd April, 1924. The Group Settlement Department made available a cottage which had been erected as quarters for the Field Supervisor, and this building was utilised as a temporary hospital until an eight-bed hospital was completed. At Denmark, for the eight months, 70 patients were dealt with in the hospital.

Margaret River.—Early in 1924 steps were taken to erect a hospital at Margaret River, and an eight-bed institution was opened there on 27th May. A few months' experience showed that the accommodation originally provided was insufficient, and the ward accommodation had to be doubled, nurses' quarters and other adjuncts being also provided. For the seven months during which this hospital was functioning 92 patients were dealt with.

Busselton.—The Hospital Committee at Busselton found itself involved in financial difficulties, and for this and other reasons decided that it could no longer bear its responsibility. The hospital was therefore taken over by the Department on 29th February, 1924. Two or three months later maternity wards,

in a separate pavilion, were opened as an adjunct to this hospital and, altogether, during the ten months that the Department was responsible for the management, 231 patients were dealt with.

Derby.—On the 1st August, 1924, a new hospital, which had been erected by the North-West Department, was occupied in Derby, but the old hospital continued in service in connection with the care of certain leper and venereal cases. Steps are now being taken for the establishment of a lazaret in another district altogether, and it has been arranged that the old hospital premises be handed over to the North-West Department, to be utilised as a small "lock" hospital for aboriginal cases.

Pinjarra.—Early in 1924 arrangements were made by which this hospital was leased to a fully qualified nurse to be run as a private hospital under certain specified conditions, and with the aid of a subsidy. This course was taken because the amount of hospital work did not warrant the continuance of the institution as a Government Hospital, and what was in the first place an experiment has been fully justified. Departmental responsibility has been lessened and the people of Pinjarra have been well served.

Southern Cross.—At Southern Cross, also, the hospital activities had for years been a diminishing factor, and arrangements were made there, as at Pinjarra, for the leasing of the hospital to a fully qualified nurse. This arrangement also has proved successful, and fully meets the needs of the district concerned.

WOOROLOO SANATORIUM.

The figures dealing with the operations of this institution are included in Appendix "A." The following summary shows that the smaller number of beds occupied in 1922 compared with previous years has been maintained, although there has been a small increase.

	1922.	1923.	1924.
Average beds occupied ...	141·3	144·9	156·8
Gross Cost	£24,088	£26,166	£24,863
Revenue	£7,875	£6,264	£5,341
Cost per patient per day ...	9/4d.	9/10½d.	8/7¾d.
Percentage of Revenue to Cost	32·6	23·9	21·4

In 1920 the average beds occupied numbered 199·5, and although a smaller number of repatriation cases partly accounts for the diminution, the presence of other factors has to be admitted. In November, 1924 the Honourable Minister appointed a departmental committee to investigate various unsatisfactory phases of the functions of this institution. It was apparent that a large proportion of the beds were occupied by cases of long standing, and that relatively few patients were of that type which could be regarded as suitable for sanatorium treatment. It was evident that although nominally called the Wooroloo Sanatorium, it was not a sanatorium in fact, and that the community was the loser, because whereas early cases should have an opportunity of going to the sanatorium, with a view to improvement and return to normal health, the present cir-

cumstances of the institution rendered it unpopular for the early case, with the result that the majority of persons arriving there had already passed the early stages of disease. At the close of the current year the committee was still continuing its investigations, but since then it has submitted its report to the Government.

KING EDWARD MEMORIAL MATERNITY HOSPITAL.

This institution continues to do a large amount of excellent work, and the number of cases dealt with is steadily increasing. In 1922 587 cases were dealt with, in 1923 the number had risen to 797, and in 1924 the number was 928.

Of recent years the value of ante-natal work has come to be recognised, and for some time past there has been discussion among various bodies interested in this hospital with a view to establishing ante-natal wards and clinics. It is hoped that before the next annual report is issued this proposed extension of activities will be an accomplished fact, as there is no doubt that work in this direction is of considerable value in avoiding complications and saving life.

Towards the close of the year the matron of this institution was given the opportunity of proceeding to New South Wales to undertake a special course of study at the Tressilian School there. The experience gained will be of material advantage as the knowledge is passed on by the matron to the numerous trainees, who year by year pass through her hands.

HOMES FOR THE AGED.

Old Men's Home, Claremont, and Women's Home, Fremantle.

The following summary shows that there has been but little change in respect of the number of inmates and the daily cost of maintenance at either of these institutions:—

	1922.	1923.	1924.
OLD MEN'S HOME.			
Average number of inmates	606	596	586
Gross Cost	£21,126	£20,114	£20,571
Cost per head per day ...	1/11d.	1/10d.	1/11d.
WOMEN'S HOME.			
Average number of inmates	89·7	96	96
Gross Cost	£2,372	£3,004	£3,234
Cost per head per day ...	1/8d.	1/8½d.	1/10½d.

It should be recorded here that both these institutions are the object of much useful welfare work on the part of interested organisations, and that the inmates benefit considerably by concerts, picture shows and other entertainments that are frequently given. In this regard the benefits derived by both homes from the work of the trustees of the Padbury bequest and the Ugly Men's Voluntary Workers' Association deserve special mention. All of this voluntary work tends to brighten the lives of the inmates, and materially assists the administration.

SUBSIDISED HOSPITALS.

In Appendix "B" will be found, for the years 1923 and 1924, statements:—

"B1" showing the revenue and expenditure, classified, of the various hospitals.

"B2" giving the numbers of patients, average beds occupied, and other information.

The principal figures may be summarised as under:—

	No. of hospitals.	Average beds occupied.	Total cost.
Public Hospitals—			
1921	3	426·81	£ 66,759
1922	3	439·5	70,502
1923	3	473·8	85,065
1924	3	520·4	91,102
Assisted Hospitals—			
1921	26	57·46	26,511
1922	26	63·3	24,101
1923	31	71·6	27,240
1924	37	81·3	36,675

There has been a marked increase in hospital activities during the period under review.

The larger hospitals have experienced great demands upon their accommodation. Particularly has this been the case at Perth Hospital, which in addition to serving the needs of the metropolitan population, serves as a central base hospital for the whole State.

With the steady expansion of country development, too, the need for hospital provision in many areas, hitherto unserved, has been manifest, and altogether, during the years 1923 and 1924—including hospitals managed by committees and those directly controlled by the Department—no less than 18 new hospitals have been opened.

New hospitals were built or material additions to existing hospitals undertaken as follows:—

Bruce Rock.—A fine hospital was opened here in February, 1923. The building is of brick, and contains male and female wards, operating theatre, extensive verandahs, together with necessary staff quarters, kitchen and appurtenances. It has its own electric lighting set, and the total cost was approximately £3,000.

Dwellingup.—The hospital here was erected early in 1923. It is a jarrah weatherboard structure, including two three-bed wards and a casualty one-bed ward, with quarters, kitchen, and outbuildings. The total cost, including the value of much donated material, was £1,400.

Dalwallinu.—A small hospital, constructed of cement blocks, was erected here in January, 1923, containing two two-bed wards and one one-bed ward, in addition to necessary adjuncts. The cost of the building was £845.

Three Springs.—To meet immediate needs a small farmhouse, close to the town, has been acquired at a nominal rental, and equipped by a local committee, the venture being assisted by a loan of £400 from the Public Works Department. The hospital contains two two-bed and one one-bed wards, as well as the usual appurtenances. It was opened in May, 1923.

Boyup Brook.—This hospital was opened in February, 1924. It is well constructed of jarrah, and contains a casualty room, labour ward, and male and female wards, in addition to necessary appurtenances, and extensive verandahs. The cost was £1,805.

Goomalling.—Here, as a temporary measure, a private residence was leased, equipped and opened as a hospital on the 29th February, 1924. This is preliminary to the provision of a permanent public hospital, the details of which are under discussion.

Wyalkatchem.—Prior to 1924 this hospital consisted of a small building of a more or less temporary character. During that year extensive improvements and additions, costing £1,700, were undertaken which converted it into a really good hospital structure, containing male and female wards, maternity ward, and operating theatre, with necessary quarters and appurtenances.

Wickepin.—Early in 1924, as a step towards a public hospital scheme, the people of Wickepin rented a building as a temporary hospital. Later, details for a permanent hospital were discussed, plans were prepared and approved, and since the close of the year a contract has been let for £1,873, for the erection of a suitable building.

Kojonup.—The hospital here was opened in October, 1923. It is a brick building which includes three wards of three beds each, namely, male, female (general), and maternity. The hospital is well situated on high ground, and has particularly wide verandahs. Already the committee are contemplating further additions.

Northampton.—The hospital here was opened in September, 1924. It is a weatherboard building, containing three two-bed wards, staff quarters, kitchen, etc., with verandahs all round, and cost £1,396.

Kununoppin.—The hospital is a well-built weatherboard structure, containing two two-bed wards, staff quarters, and kitchen, with extensive verandahs and outbuildings. The cost was £1,056, and the building was completed in October, 1924.

Corrigin.—Towards the end of 1924 a hospital, built of jarrah, was completed here at a cost of £1,600. It contains male and female wards (two beds each), maternity ward (two beds), and labour ward (one bed), as well as quarters, kitchen, etc., and ample verandah space.

Kukerin.—A small hospital was opened here in September, 1924. It consists of two two-bed wards, with nurse's room and kitchen, and verandah back and front. It is a weatherboard building, and the total cost was £626.

Beverley.—In June, 1924, a maternity block was erected here as an addition to the main hospital. The block included one four-bed ward, a two-bed ward, a one-bed ward, and a labour ward, in addition to two staff rooms. The contract price was £1,200.

Mt. Magnet.—This hospital and the work of the committee are worthy of remark. During the period under review considerable improvements have been undertaken. These include the provision of extensive verandahs, an aborigines' ward, and the installation of electric light by means of a generating set.

It may be remarked, too, that at the close of 1924 several other schemes were in hand, but have not reached finality. These schemes were in various stages of progress, and dealt with the provision of

small hospitals at Nannup, Kondinin, Dumbleyung, Kunin, Quairading, Wellard (Peel Estate), Tambellup, and Pemberton.

THE PUBLIC HEALTH.

Public Health officials the world over have until recently had to admit that in spite of their best endeavours certain of the commoner infectious diseases have shown no tendency to decline.

More particularly has this been the case in regard to diphtheria and scarlet fever. Routine swabbing of contacts of diphtheria and strict isolation of cases and carriers must have had some effect in reducing the actual number of cases, but year after year with unfailing regularity, sometimes almost throughout the year, the disease is always with us.

It is true that since the introduction of antitoxin the death rate of diphtheria has fallen from some 40 per cent. to about 4 per cent., but just as surely as each year a new group of susceptible children enter upon school age and school life, so does diphtheria attack an undue proportion of them.

It would seem, however, that we have at last a means of combating this susceptibility to diphtheria amongst children of school age, and so largely reducing, if not completely controlling, its incidence.

This immunisation against diphtheria is generally preceded by what is known as the Schick test, which is performed for the purpose of detecting susceptibility to diphtheria, though so high is the percentage of susceptibles amongst children under school age that the test can be entirely dispensed with in their case and all be regarded as susceptible.

Protection is given by an inoculation, on three separate occasions, with an interval of ten days, of toxin-antitoxin, after which the child develops, in the vast majority of cases, complete immunity to diphtheria, and will show a negative reaction to the Schick test. The operation is a simple one, and when carried out with reliable material, such as may now be obtained from the Commonwealth serum laboratories, is entirely without danger or unpleasant effect.

Those authorities who have already carried out immunisation on anything like a wholesale plan speak enthusiastically of the success achieved, and it behoves all health authorities to be up and doing in this regard, for diphtheria has too long been the bogey of public health administrators and the terror of parents.

Western Australia, where diphtheria has for many years been prevalent, must not be behind hand in this matter, whilst its relatively small population and climatic and social advantages hold out great possibilities for the complete control of the disease by this means.

All that is required for a successful campaign are the necessary funds for the establishment of a clinic and the whole-hearted support of the people in availing themselves of the facilities, when offered.

For those desiring private service the private medical practitioner is available, who should be able to carry out the inoculation equally well.

It is considered that a clinic could best be established in connection with the Children's Hospital, where the bulk of the protective work could be carried out for the metropolis; but arrangements might also be made for the attendance of officers at various outlying centres in the metropolitan area from time to time as well.

It is strongly urged that local health authorities in the metropolitan area immediately combine and subscribed towards the cost of such a scheme, which the Government has already agreed to subsidise to the extent of one-third. It is felt that in no better direction could the financial resources of health authorities be applied at the present moment, whilst the taxpayer is entitled to and should demand this protection for his children.

Another matter which has exercised the minds of public health officials during the past year or two is the question of the efficient supervision of the sanitation of group settlements.

In a number of different areas are springing up new communities of considerable size and of quite large populations, where people unsophisticated, so far as Australia and its health hazards are concerned, are living under very primitive conditions.

Many have come with the determination to work and succeed, and are in fact excellent settlers, but many are either ignorant of the elementary rules of hygiene and sanitation or, in their eagerness to establish a home and make a living, forget or neglect those rules. For a considerable time they live under conditions somewhat similar to those which existed in the early gold-seeking days when sanitation was largely forgotten for the lure of gold, and when the inevitable results of that forgetfulness, the intestinal diseases, typhoid and dysentery, were rampant.

If these settlers are to succeed and be healthy and bring up healthy families they must begin in the right way. Their settlements must be established upon right sanitary lines from the beginning.

Their water supplies must be protected, the soils unpolluted, and their standard of cleanliness such that the ubiquitous fly, bad enough at any time in the virgin bush of Australia, is reduced to a minimum. They must remember that amongst their number is a fair percentage of typhoid and dysentery carriers constantly available for the spreading of infection per medium of neglected sanitation and the filthy instincts of the fly.

In the wet season filth may be washed from polluted soils and surfaces into water supplies. At other seasons uncovered foods may become the feeding ground of myriads of filthy flies whose last resting place was the uncovered garbage tin, or worse still, the unguarded excreta in the privy pan.

These new-comers, therefore, in the interests of themselves and of Western Australia as a whole, must be watched, instructed, encouraged and, if necessary, coerced into developing settlements clean from their inception, and must not, as in the days before we knew better, be left to derive their knowledge from the disastrous results of ignorance. Inspection and re-inspection of these new settlements by officers able to talk, teach, and, if necessary, drive into these budding communities a proper appreciation of their responsibilities, are absolutely essential, and for this purpose the necessary staff must be made available.

At present it is not; and the very greatest difficulty is being found in doing what is necessary in this direction.

It must be recognised that no development of land settlement and population can proceed on safe and sound lines unless the public health organisation, providing adequate sanitary supervision and carrying enlightenment regarding the laws of health, is permitted to expand sufficiently to embrace it. The official reply to requests for the wherewithal to expand is only too often, "Your organisation is already too large; there is too much centralisation and not enough local responsibility and control in regard to these matters." But the fact is overlooked that the intensity of local health effort is entirely a measure of the knowledge possessed and the interest and activity evinced by those individuals that go to make up a local health authority, whilst those communities mentioned above have not yet reached the stage of development or organisation that makes local control possible. They are, therefore, the responsibility of the Central Health Authority.

VITAL STATISTICS.

Western Australia.

	1922.	1923.	1924.
<i>Mean Population—</i>			
Males	180,697	189,429	195,341
Females	158,727	164,386	168,783
Total	339,424	353,815	364,124
<i>Births—</i>			
Males	4,163	4,014	4,215
Females	3,968	3,840	4,086
Total	8,131	7,854	8,301
<i>Birthrate—</i>			
Per thousand of Population	24.0	22.6	23.1
<i>Deaths—</i>			
Males	1,994	1,907	2,039
Females	1,173	1,023	1,224
Total	3,167	2,930	3,263
<i>Death Rate—</i>			
Per thousand of population	9.3	8.4	9.1
<i>Natural Increases—</i>			
Rate per thousand of population	14.7	14.2	14.0
<i>Infantile Mortality per thousand Births—</i>			
Metropolitan Area	60.1	61.7	61.5
Rest of State	50.9	49.9	41.6
Whole State	55.7	56.2	49.9

Birth, Death and Infantile Mortality Rates, 1913-24.

							Birth Rate.	Death Rate.	Infantile Mortality.		
									Whole State.	Metropolitan Area.	Rest of State.
1913	...	...	...	...	...	...	29.4	9.4	70.0	80.8	60.3
1914	...	...	...	...	...	...	28.4	9.4	68.2	...	...
1915	...	...	...	...	...	...	27.9	9.3	66.6	...	...
1916	...	...	...	...	...	...	27.2	9.8	66.3	...	...
1917	...	...	...	...	...	...	25.7	9.1	57.1	68.9	...
1918	...	...	...	...	...	...	23.1	9.2	57.3	66.9	47.3
1919	...	...	...	...	...	...	21.7	11.2	61.3	65.2	57.1
1920	...	...	...	...	...	...	24.7	10.3	66.1	75.9	54.4
1921	...	...	...	...	...	...	23.4	10.4	78.3	79.1	77.3
1922	...	...	...	...	...	...	24.0	9.3	57.7	60.1	50.9
1923	...	...	...	...	...	...	22.6	8.4	56.2	61.7	49.9
1924	...	...	...	...	...	...	23.1	9.1	49.9	61.5	41.6

Rates of Australia and New Zealand, 1920-21.

		Birth Rate.					Death Rate.					Infantile Mortality.				
		1920.	1921.	1922.	1923.	1924.	1920.	1921.	1922.	1923.	1924.	1920.	1921.	1922.	1923.	1924.
New South Wales	...	26.59	25.92	25.7	24.68	24.11	10.32	9.51	8.9	9.61	9.35	69.41	62.9	54.0	60.6	58.9
Queensland	...	27.58	26.59	25.5	24.89	23.87	10.82	9.34	9.1	9.83	8.87	63.24	54.1	50.0	53.9	51.1
South Australia	...	25.45	24.07	23.7	22.60	21.88	10.76	10.02	9.1	9.59	9.19	67.34	65.4	48.0	60.3	51.3
Tasmania	...	26.37	26.97	27.1	26.27	25.07	9.35	10.30	9.3	9.92	9.89	65.51	78.4	56.0	57.4	54.9
Victoria	...	24.07	23.13	23.1	22.31	22.01	11.19	10.51	9.7	10.71	10.05	73.7	72.7	53.0	65.7	61.3
Western Australia	...	24.7	23.4	24.0	22.55	23.09	10.14	10.4	9.3	8.41	9.08	66.02	78.3	55.7	56.2	49.9
Commonwealth	...	25.74	25.0	24.7	23.77	23.24	10.62	9.9	9.2	9.89	9.47	69.14	65.7	53.0	60.5	57.0
New Zealand	...	25.36	23.34	23.17	21.94	21.5	10.27	8.73	8.77	9.03	8.29	50.57	47.8	41.89	43.8	40.23

The tables show that the gradual fall of the birth rate continues, both in the Commonwealth as a whole and in Western Australia. It is not possible to give in detail the rates for various portions of the State; but for 1924 the Government Statistician has subtracted from the number of births which took place in the metropolitan area those of the children whose parents usually reside outside the metropolitan area. Thus it has been possible for that year to compute the birth rate for the metropolitan area—19.5, and for the rest of the State—25.5.

The death rates for the various States and for Western Australia continue to decline. That recorded for this State in 1923, namely, 8.41, is a record for Australia. It must be remembered, however, that the character of population of the State rather favours a low death rate at times when considerable numbers of young adult immigrants are arriving. It is interesting to note that the standardised death rate for England and Wales for 1923 was only 10.3, and the crude death rate of the Commonwealth in that year was 9.89. The figures are not strictly comparable, but if such figures were obtainable, they would probably closely approximate.

The records of infantile mortality show a relatively low figure for 1923, and a record of 49.9 for 1924. It will be seen that the lesser figure for 1924 is due almost entirely to a lowering of the rate for the rest of the State, whilst that of the metropolitan area has remained approximately the same during the last three years, and is in 1924 approximately 50 per cent. higher than that for the rest of the State.

It is very satisfactory to be able to record that since the publication of the last Annual Report for

the years 1921-22, an Infant Welfare Service has been inaugurated in the State. The credit of its initiation belongs chiefly to the committee of the Children's Protection Society, who took a leading part in its formation. The Infant Health Association of Western Australia was formed in 1923 by the co-operation of the Children's Protection Society, the Silver Chain, the Perth City Council, and the Department of Public Health, and in that year three "centres," at each of which a specially qualified nurse was employed, were started in the metropolitan area. During 1924 two additional centres were set up—one in Fremantle under the direction of a local committee, assisted by the local Councils, and one in Northam—and five full-time nurses are now employed. The work may be said to be progressing satisfactorily, and it is to be hoped that eventually the services of specially trained nurses will be available throughout the whole State, working upon uniform lines under the auspices of the central Association.

The Matron of the King Edward Memorial Hospital, which is the State training school for midwives, was given leave of absence to attend the course of instruction given at the Tressilian Training School in Sydney, and it is hoped that before long it will be possible to develop a school of instruction for the purpose of giving special training in connection with that institution. In the meantime as much as possible with regard to mothercraft and the care of babies is being taught to the midwifery trainees. The development of this infant welfare work is regarded as of the very greatest importance, and part of the time of Dr. Jull, the Medical Officer of Schools, has,

during the past year, been allotted to this work, despite the consequent curtailment of the school medical inspection, which is very regrettable.

An analysis was recently made of the causes of deaths of infants under one, for a period of five years. It showed that the deaths under one month, recorded chiefly as due to prematurity, inanition, convulsions, etc., represented 44 per cent. of the total; enteritis was responsible for 18 per cent. of the total deaths under one year, and broncho-pneumonia, and inflammations of the lungs secondary to diseases such as measles, whooping cough, and bronchitis, were responsible for 10 per cent. of the total. Of the deaths occurring during the second year of life, enteritis was responsible for 42 per cent., and respiratory disease for 36 per cent. It is obvious that the greater part of this mortality from enteritis and pulmonary disease during the first and second years of life could be prevented by the application of that knowledge which it is the aim of infant welfare work to disseminate. The mortality under one month, which is commonly chiefly ascribed to ante-natal causes, can also be attacked on the same lines.

A proposal has been made and a considerable amount of money has been already raised for the erection of ante-natal and post-natal clinics in connection with the King Edward Memorial Hospital.

It will be noted that the infantile mortality in 1924 of New Zealand, a country in which infant welfare work is perhaps most highly developed, was only 40.23 as compared to 57 for the Commonwealth.

In this connection the recent statistics of Great Britain are of very great interest. The infant mortality rate for England and Wales has been reduced during the last ten years from approximately 100 to 77 in 1922 and 69 in 1923. In the latter year the mortality rate in the south of England as a whole was only 55, and in some of the large boroughs in and around London, the figures for the year compare extremely favourably with those for Australia and New Zealand, for example, London 61, Poplar 60, West Ham 60, East Ham 51, Woolwich 43. In view of the unemployment existing in Great Britain and of the alleged and undoubted overcrowding and poorer social conditions existing there these figures should cause us furiously to think.

INFECTIOUS DISEASES.

Typhoid Fever.

	1921.	1922.	1923.	1924.
Cases Notified	391	244	251	220
Deaths	43	25	18	22
Case mortality (per cent.)	10.9	10.2	7.1	10
Deaths per 1,000 of population	0.12	0.073	0.05	0.06
Percentage of total deaths	1.23	0.79	0.61	0.67
<i>Districts Principally affected:</i>				
Metropolitan Area	184	107	126	137
Perth	81	41	69	81
Subiaco	19	24	12	29
Maylands	...	...	4	11
Kalgoorlie	11	17	27	8
Boulder	39	34	16	4
Geraldton	12	7	13	15
Pinjarra	67	3	5	2
Mt. Barker	...	...	10	...

The incidence of typhoid fever has shown during the last few years a welcome diminution, the number of cases notified during 1924 being the lowest ever recorded in this State. The typhoid incidence in this State is still, nevertheless, higher than that of the Commonwealth, which in its turn is considerably higher than that of Great Britain.

The high incidence in this State is no doubt associated with the wide scattering of population and correspondingly great difficulty of maintaining satisfactory sanitation. A relatively small proportion of the people, moreover, live in sewered areas. It is satisfactory to notice that the sewerage of the relatively densely populated metropolitan district of Subiaco has at last been completed. It will be seen that no fewer than 29 cases were notified from Subiaco in 1924.

The relatively excessive prevalence in the towns of Kalgoorlie and Boulder, which has been commented upon in previous reports, appears to be decreasing.

No localised outbreaks of any magnitude occurred during the period under review.

Dysentery and Enteritis.

The notifications of dysentery as such were few in number, only six cases being notified in 1923 and 15 in 1924.

During 1923 attention was drawn to the fact that several cases of liver abscess, which is a sequela of the amoebic form of the disease, were under treatment in Kalgoorlie Hospital, and the services of Dr. C. H. Shearman, Government Bacteriologist, were made available for a short time in order to investigate the matter. Dr. Shearman's report is included as Appendix F. It shows that of 35 patients then in Kalgoorlie Hospital three showed the presence of cysts (a latent form of the amoebic dysentery parasite) in the excreta. One of these patients was foreign-born (Italian), but the other two were Australian and had not been out of Australia. Similarly one of the cases of liver abscess recently in hospital had never been out of Australia. Dr. Shearman concludes that amoebic infection must be regarded as endemic in the Eastern Goldfields district, and that this endemicity is associated with the presence there of a considerable number of immigrants from the Mediterranean littoral, where the disease has long been present.

The demonstration of amoebic cysts in the excreta of healthy persons is not necessarily a cause for alarm, since it has been shown that a small percentage of the population of England, where the actual disease is very rare, also carry the cysts; but there can be no doubt that under the climatic conditions of Western Australia, and particularly of the goldfields, cases of actual disease occur with some frequency. This is borne out by the cases of liver abscess referred to; and it is highly probable that a number of cases of diarrhoea occurring in the woodcutters' camps and elsewhere on the goldfields are due to this infection and are never notified. The circumstances point to the need for more careful supervision of sanitation in the district.

It is satisfactory to record that the bacteriological laboratory established by the Commonwealth in Kalgoorlie is completed and has begun to function during the present year. The work of the laboratory should tend to clarify the position in regard to enteric infections on the goldfields generally.

One case of amoebic dysentery in a woman who has never been out of Australia was discovered in Fremantle during 1924.

The *bacillary* form of the disease is probably much more common than is generally appreciated, though the number of cases diagnosed by bacteriological examination of stools is limited each year to a few among the inmates of Claremont Asylum, and a few cases of infants at the Children's Hospital. Only a very small proportion of the total number of cases ever come to be submitted to bacteriological examination. It is now generally agreed that a considerable proportion of the severe cases of infantile diarrhoea, showing the presence of blood and mucus in the stools, are really cases of bacillary dysentery, and of these, as mentioned later, a large number occur each year. Moreover, the statistical returns of the State show that the deaths, during the last three years, of an average of eight children between the ages of 3 and 5, and an average of 26 persons over 5 years, are recorded as due to diarrhoea and enteritis, and it is not unlikely that a proportion of these were cases of bacillary dysentery. Further investigation of the actual prevalence of this infectious disease can scarcely be made until more adequate laboratory provision is made in the various districts of the State.

Diarrhoea and Enteritis (under two years).

—	1921.	1922.	1923.	1924.
Deaths	228	154	143	117

The figures for the two years under review show a gratifying reduction. How much of this may be due to human agency and how much to climatic conditions and circumstances outside individual and communal control it is not possible to say. Certainly climatic conditions during the period were not unduly unfavourable. Certainly, also, the actual number of deaths recorded is very large; and it is probable that the great majority could have been prevented with the aid of already existing knowledge, had it been possible to apply it.

The following table shows the infantile mortality from diarrhoea only, since 1917:—

Year.	Number of Births Registered (exclusive of still-births).	Number of Deaths from Enteritis under one year.	Death rate per 1,000 births.
1917	7,882	70	8.9
1918	7,106	84	11.8
1919	6,937	96	13.8
1920	8,149	169	20.7
1921	7,807	181	23.4
1922	8,131	117	14.3
1923	7,854	113	14.4
1924	8,301	82	9.9

The figures of the Government Statistician again show that 70 per cent. of the deaths from enteritis of infants under one occurred in the metropolitan area, in which, however, only 47 per cent. of the total births occurred.

Scarlet Fever.

—	1919.	1920.	1921.	1922.	1923.	1924.
Cases notified	657	468	234	96	62	66
Deaths	2	3	...	1	...	1

The low prevalence of this disease is continuing longer than was expected. An epidemic may be anticipated in the near future.

Measles.

—	1921.	1922.	1923.	1924.
Deaths	24	2	1	38
Percentage of total deaths	.69	...	...	1.2

The table shows that the disease became prevalent in 1924, when no fewer than 38 deaths, 21 of which were under two years and all under 10, were recorded. As has repeatedly been pointed out, these deaths are in the main preventable.

Whooping Cough.

—	1921.	1922.	1923.	1924.
Deaths	58	13	5	24
Percentage of total deaths	...	...	...	0.8

This disease also became prevalent in 1924 and was responsible for 24 deaths, 22 of which were under two years of age. The majority of these deaths also should be prevented.

Diphtheria.

	1921.	1922.	1923.	1924.
Cases notified	958	577	504	511
Deaths	44	21	18	14
Case mortality per cent.	4.59	3.6	3.5	2.7
Per cent. of total deaths	1.26	.66	0.6	0.5
<i>Districts Mainly affected :</i>				
Metropolitan	501	347	309	363
Perth	239	187	185	181
Subiaco	56	47	59	70
Fremantle	31	14	3	19
Fremantle, East	30	11	8	1
Cottesloe	19	9	5	1
Claremont	19	10	5	8
Maylands	36	13	4	8
Queen's Park	23	55	0	8
Midland Junction	8	13	7	12
Kalgoorlie (Municipality and Road Board) ...	51	35	18	30
Boulder	22	30	17	11
Northam	37	11	13	11
Narrogin	14	8	15	2
Albany	36	4	26	13
Bunbury	45	17	3	2
Harvey	19	13	2	...
Geraldton	16	8	4	6
Pinjarra	21	2	3	2
Collie	14	18	0	7

The incidence of this disease continues to be remarkably—one might almost say alarmingly—low. It cannot be held that the reduced prevalence has been due in any marked degree to deliberate preventive measures, and it is to be feared that the State is likely to suffer severely in the future. It is now generally agreed that diphtheria in closely settled countries can only be prevented by the method of testing for susceptibility and immunising against the diphtheria organism, that is associated with the name of Schick.

During 1924 a valuable experiment was carried out in Northam, where the two doctors, with the assistance of the health inspector of the town, carried out a campaign of Schick testing and immunisation among the families of their lodge patients. During

this effort 226 persons, mostly children, were tested and of these, 100, that is 44 per cent., gave positive reactions which showed that they were susceptible to diphtheria. Of the 100 susceptibles 67 presented themselves for immunisation, and received the protective injections. The Department of Public Health assisted in this praiseworthy undertaking to the extent of supplying the material required, and undertaking to give free hospital treatment to any person who had been tested, and immunised if necessary, and who thereafter developed diphtheria.

The table gives particulars of the districts mainly affected during the four years 1920-24. It will be seen that considerable variations occur from time to time in the degree of prevalence in the various districts.

Tuberculosis.

	Cases notified.	Deaths.	Deaths per 1,000 of population.	Percentage of total Deaths
<i>Tuberculosis of Lungs—</i>				
1919	467	289	.89	8.05
1920	442	259	.77	7.6
1921	424	277	.83	7.9
1922	387	256	.75	8.08
1923	361	216	.62	7.3
1924	381	228	.63	7.0
<i>Other forms of Tuberculosis</i>				
1919	...	24	.074	.668
1920	...	29	.086	.85
1921	...	23	.069	.66
1922	...	29	.085	.91
1923	...	16	.046	.54
1924	...	22	.061	.67
<i>All forms of Tuberculosis—</i>				
1919	...	313	.967	8.71
1920	...	288	.86	8.50
1921	...	300	.90	8.62
1922	...	285	.84	9.00
1923	...	232	.66	7.84
1924	...	250	.69	7.67

As may be seen from the above table, the number of cases and the number of deaths were relatively low during the last two years, whilst the death rate per thousand of population from tuberculosis has reached a lower figure than ever before recorded. The percentage of the total deaths due to tuberculosis is also apparently diminishing.

The statistics show that tuberculosis has been diminishing very gradually in this State since 1895, when actual figures were first recorded. This slow decline was interrupted at the end of the war period by a rise similar to that which was experienced in other countries, and this period of increased prevalence has now passed.

As has previously been pointed out, the mortality from tuberculosis is considerably greater in this State than in Australia as a whole—some 22 per cent. higher during the last three years. This is due in the main to the influence of the mining industry. The figures for the three years 1921-23 show that the death rates per 100,000 from tuberculosis in the Commonwealth are—males 73, females 53, whilst in Western Australia the corresponding figures are for males 101, and for females 51.

The death rate from other forms of tuberculosis in this State, and in Australia, is about one-third of the corresponding rate in England and Wales, whereas that of pulmonary tuberculosis is about two-thirds of the English rate. This is interesting in view of the fact that a considerable proportion of the deaths from other forms are due to infection with germs of bovine origin. The inference is that tubercle infection from milk is much less common, or at any rate less serious, in Australia than in England.

Influenza, Bronchitis, and Pneumonia.

—	1919.	Average 1920-22.	1923.	1924.
Deaths from—				
Influenza ...	554	37	35	48
Broncho - Pneu- monia ...	70	61	83	99
Pneumonia ...	140	146	147	157
Bronchitis ...	44	41	33	50

The figures given above do not indicate any unusual excess of influenza during the period, but show that the year 1924 was a rather unfavourable one in regard to respiratory diseases in general.

Infantile Paralysis (Acute Anterior Poliomyelitis).

—	Average 1918-22.	1923.	1924.
Cases notified ...	3	8	3

The number of cases notified in 1924 was reassuring after the rise of 1923. The recent severe epidemic in New Zealand gives ground for apprehension as to the future.

Cerebro-spinal Meningitis.

—	Average 1918-22.	1923.	1924.
Cases notified ...	4.5	3	2

There is no sign of any epidemic prevalence of this disease since the year 1918, when 15 cases were recorded.

Malaria.

—	1921.	1922.	1923.	1924.
Cases notified ...	39	41	23	29

The majority of the cases shown in the table were notified from Wyndham and Broome, a few cases of recurrences, chiefly in returned soldiers, being notified in the rest of the State.

Dengue Fever.

—	1919.	1920.	1921.	1922.	1923.	1924.
Cases notified	271	38	41	12	30	...
From Broome	34	10	37	5	...	...
From Carnarvon	8	...	...	...	...	...
From Wyndham	229	28	4	7	2	...

This table shows a remarkable reduction in the number of notifications. The etiology of this disease is not thoroughly understood and the diagnosis is somewhat uncertain, except, perhaps, during epidemic periods. It is quite possible that scattered cases may be missed, especially in non-epidemic periods, and it is also possible that a change of doctor in a district might lead to an alteration in the number of cases recognised.

Beri Beri.

—	1919.	1920.	1921.	1922.	1923.	1924.
Cases notified	32	63	31	38	15	33
Deaths ...	5	12	9	13	15	17

The cases notified during 1923 and 1924 all occurred in Asiatics engaged in the pearling industry.

Leprosy.

During the period a survey of the North-West in connection with this disease was carried out by Dr. Cook, an officer loaned by the Federal Government. Several new cases and one or two suspected cases were discovered by him. One case in a white was recognised in 1923, and was placed in isolation. The lazaret for native and half-caste cases in Derby now contains nine cases, and two female natives are in isolation at Cossack. It is hoped to provide more suitable accommodation for these native patients in the near future.

The Puerperal State and Puerperal Sepsis.

Eighteen cases of puerperal sepsis were notified in 1923 and 16 in 1924. In each case the midwife concerned was visited as usual by one of the supervisory nurses of the Department. The subjoined table shows the number of deaths due to child-birth and those due to septicaemia, together with the rates per 1,000 births since 1917. The tendency of the figures is perhaps slightly encouraging.

Year.	No. of births, including still-births.	Deaths from all causes of Puerperal State*, exclusive of Accidents of Pregnancy.		Deaths from Puerperal Septicæmia.	
		Number.	Rate per 1,000 births.	Number.	Rate per 1,000 births.
1917	8,106	28	3·4	12	1·5
1918	7,349	29	3·9	7	·9
1919	7,155	28	3·9	9	1·2
1920	8,397	41	4·9	15	1·7
1921	8,032	20	2·5	6	·7
1922	8,379	30	3·6	8	0·9
1923	8,076	22	2·7	8	1·0
1924	8,752	27	3·1	8	·9

* Includes the following headings, as laid down in the Registrar-General's list of causes of death :—
1. Puerperal Hæmorrhage.
2. Other Accidents of Labour
3. Puerperal Septicæmia.
4. Puerperal Albuminuria, Convulsions.
5. Puerperal Phlegmasia, alba dolens.
6. Following Childbirth
7. Puerperal diseases of the breast.

Detailed infectious diseases return will be found in Appendix C hereto.

Venereal Disease.

The number of new cases of Venereal Disease notified to the Department during the two years under review, was for 1923—700, including 548 cases of gonorrhoea and 100 cases of syphilis, and for 1924—

652, including 536 cases of gonorrhoea, and 88 cases of syphilis.

These figures represent a still further fall in incidence of these diseases and maintain the progressive decline which has been apparent for some years.

The table below shows for the two main diseases, gonorrhoea and syphilis, the figures for 8½ years, during which the Venereal Diseases Regulations have been in force:—

CASES OF SYPHILIS AND GONORRHOEA SINCE ACT CAME INTO FORCE.

June, 1916—December, 1924 (8½ years).

Year.		Syphilis.		Gonorrhoea.		Total.
		Males.	Females.	Males.	Females.	
1916 (7 months)	...	273	47	685	62	1,067
1917	...	195	84	823	141	1,243
1918	...	114	52	681	106	953
1919	...	115	44	719	91	969
1920	...	137	29	683	82	931
1921	...	120	44	782	124	1,070
1922	...	68	35	536	55	694
1923	...	81	19	508	40	648
1924	...	72	16	485	51	624
Totals	...	1,175	370	5,902	752	8,199

The decline during both years is most evident in the case of male gonorrhoea and female syphilis whilst reduction has also taken place in male syphilis cases reporting in the primary and secondary stages.

The increase in male tertiary syphilis cases is probably due to the increasing use of the Wassermann test in diagnosis of obscure cases by medical practitioners, or it may be that whilst the number of new infections has diminished of recent years, old cases from previous years are increasingly seeking treatment. Whether it be due to the effect of the V.D. Regulations, to remoteness from the war period or to other causes, there is no doubt that there is a progressive decline in the incidence of venereal disease.

Many are ever ready to ascribe this to the failure of notification on the part of medical practitioners, but there is little if any evidence to support this. An almost similar number of practitioners continue to notify cases, and if these notify some, there is no reason why they should not notify all cases seen by them, seeing that in the first instance, notification is anonymous.

On the other hand, there have sprung up a certain number of specialists in this work who now treat the bulk of the cases, so that some reduction in the numbers of medical men reporting is to be expected.

There is moreover little evidence that unqualified practice is being carried on,

Age Incidence.

It is interesting to review the age incidence of venereal disease, and the table below shows this for the period June, 1916—December, 1922, and covering 5,882 male cases and 992 female cases.

It will be seen that the maximum incidence period for both sexes lies very definitely between 20 and 30 years of age, which, of course, is to be expected.

AGE INCIDENCE (PERCENTAGE IN EACH AGE GROUP) OF TOTAL GONORRHOEA AND SYPHILIS FOR THE PERIOD JUNE, 1916-DECEMBER, 1922.

Sex.	Under 10.	10 years and under 20.	20 years and under 30.	30 years and under 40.	40 years and under 50	50 years and over.
Males (5,882 cases)	⁰ / ₁₀₀ 6	⁰ / ₁₀₀ 8.9	⁰ / ₁₀₀ 46.5	⁰ / ₁₀₀ 25	⁰ / ₁₀₀ 12	⁰ / ₁₀₀ 6.3
Females (992 cases)	⁰ / ₁₀₀ 9.5	⁰ / ₁₀₀ 16	⁰ / ₁₀₀ 44.7	⁰ / ₁₀₀ 18.3	⁰ / ₁₀₀ 7.7	⁰ / ₁₀₀ 3.5

NOTE.—The high perentage of cases in females under the age of ten is largely due to an unusually large number (30) of cases of gonorrhoea in 1917 in this age group.
Excluding the year 1917 the percentages are for females :—7.5%, 16%, 46%, 19.2%, 8% and 33.3%.

Administration.

The administrative activities in regard to venereal disease legislation, for the two years under review, are shortly set out in the following table:—

	1923.	1924.
Notifications received of cessation of treatment	379	246
Number of persons involved ...	283	212
Total number of resumptions of treatment to 31st December	282	159
Number of persons resuming to 31st December	200	129
Defaulters not traced	56	53
Defaulters left the State	9	9
Defaulters deceased	3	...
Cases abandoned because no further action possible (especially cases of Tertiary Syphilis)	26	24
Prosecutions under Section 259 (knowingly infecting)	2 (females)	1 (females)
Prosecutions under Section 248 (persistent neglect of continuance of treatment)	15 (males)	3 (males)
Orders issued under Section 256 (compulsory examination)	...	6 (females)
Orders served under Section 258 (discharged prisoners)	3	4

NOTE.—A certain number of defaulter's cases remain pending at end of each year.

Details of the various venereal diseases notified during the two years being reviewed will be found in Appendix D.

LABORATORY.

The details of work done in the Pathological Laboratory, during the two years under review, will be found in Appendix E.

The number of specimens examined during each of these years was practically the same, if throat swabs, of which there were some 4,000 fewer during 1924, be excluded.

The Department has been relieved of a large number of these since a pathologist was appointed to the Perth Hospital staff.

The figures which bulk most largely in the year's totals are those for examinations in regard to diphtheria, tuberculosis, and venereal disease.

Examinations in regard to diphtheria inclnde swabs from the throats of persons apparently suffering from diphtheria, from individuals, usually of the same family, who have been in contact with the

patient, and those resulting from wholesale examination of schools or classes in which cases have been occurring, with the object of discovering carriers.

Examinations in regard to tuberculosis consist mainly of sputa from undiagnosed cases, with a view to assisting diagnosis and from known cases, with a view to determining progress or infectivity.

Examinations in regard to venereal disease include, similarly, specimens for diagnosis and examinations to indicate progress of actual cases. Over one thousand blood tests (Wassermann Reactions) are done annually.

Over 200 tumours were examined microscopically during each of the years under review, with a view to determining whether abnormal growths were cancerous or not.

This is a most important part of the work which, besides recognising cancer, often in its early stages, when immediate removal may mean complete cure, also guides the surgeon as to the extent and nature of his operation.

Over 200 bacterial vaccines are prepared annually for the treatment of various conditions.

Frequently better results are obtained in the treatment of various infections by the use of vaccines prepared from the patients' own bacteria than from stock strains of the same organism.

Under the heading of "general bacteriology" will be found a variety of other investigations, both chemical and miseroscopical, done for private medical practitioners and in the interests of public health.

SCHOOL MEDICAL INSPECTION.

The report of the Medical Officer of Schools, which is appended, shows that the small staff engaged has done excellent work in the metropolitan area, and that the schools in Kalgoorlie have been visited once during the period.

Since, however, modern preventive medicine, from which so much may well be expected, can be most effectively applied in infancy and childhood, it is extremely regrettable that no developments in the organisation of this work can be recorded. The existing staff of one medical officer and three nurses is totally inadequate, and provides at best a partial service only for the metropolitan area. The addition of one half-time medical officer for infant welfare and school work, which has recently been made, will do but little to better the position. At least three full-time medical officers or an equivalent in

part-time officers, are required to give a minimum of effective service throughout the State. Up to the present, moreover, not even has a beginning been made in providing a service of preventive dentistry. As the report of the medical officer shows, this is an urgent need, and a full-time school dentist should be appointed without delay.

So far as the work of the existing staff goes, I have much pleasure in attesting to its high quality and value, and to the devotion with which it has been carried out.

It is gratifying to note the considerable reduction in prevalence of pediculosis and the increasing co-operation of the teachers in this and other matters relating to the health and cleanliness of the children. It is satisfactory also to see that the greater attention which is being paid to oral hygiene is resulting in some improvement in the state of the teeth. In that connection the continued work of the members of the Odontological Society in the small dental clinic, conducted at the Health Department, deserves grateful recognition.

Lectures upon hygiene have been regularly delivered to the students in the Teachers' Training College by the Medical Officer of Health. This represents a branch of school medical work which is of the greatest importance, and it is to be regretted that owing to the pressure of the curriculum there and inadequate staff, the courses cannot be made more comprehensive.

DISINFECTANTS.

As an addendum will be found the report of an extensive investigation made by Dr. Dale, of this Department, and Mr. J. G. C. Campbell, B.Sc., into the efficiency, under varying conditions, of the various lines of disinfectant upon the market.

The report represents the result of much tedious and painstaking work, which breaks new ground in that it deals with disinfectants under their trade names, and includes many new lines probably not previously examined in a comparative way.

It is felt that this piece of work, quite apart from its scientific value, should be of considerable assistance to health authorities generally, enabling them to form a better judgment of the many lines of disinfectants constantly being brought before them.

MIDWIVES' REGISTRATION BOARD.

The Midwives' Registration Board, which functions under the provisions of the Health Act, decided in 1922 to conduct the examination of Midwives applying for registration.

During 1923, thirty-two candidates presented themselves for examination, and during 1924 the number was thirty-seven.

Reciprocal agreements have been entered into between the Board and the following authorities:—

- (1.) Nurses' Registration Board, Queensland.
- (2.) Midwives' Board, Victoria.
- (3.) Division of Nursing, Department of Public Health, New Zealand.

- (4.) The Australian Nursing Federation, and
- (5.) Nurses' Registration Board, South Australia.

NURSES' REGISTRATION BOARD.

This Board was appointed in 1922 under the provisions of the Nurses' Registration Act, and functions chiefly as the controlling authority for the training and the registration of General Nurses.

Persons desiring to take up the profession of nursing are first required to undergo an Education and Medical Examination. They then commence at one of the recognised Training Schools and are trained for a period of three years. During this time they are required to pass the examinations held by the Training Schools, and at the end of the period of training they must sit for the final examination conducted by the Board.

During 1923, sixty-one candidates presented themselves for the final examination, and seventy-two presented themselves in the following year.

Reciprocal agreements have been entered into between the Board and the following authorities:—

- (1.) Nurses' Registration Board, Queensland,
- (2.) Division of Nursing, Department of Public Health, New Zealand, and
- (3.) Australian Nursing Federation,

while steps are now being taken to finalise similar agreements with the Nurses' Registration Boards of Victoria and South Australia.

DEPARTMENTAL VISITING NURSES.

The chief duties of these officers are, the supervision of registered midwives, inspection of maternity homes, and the visiting of tuberculous persons.

During 1923 1,305 visits were paid to tuberculous patients for the purpose of giving advice as to methods of living and for the safe-guarding of contacts. During the same period 1,768 visits were made in connection with maternity cases. In 1924 1,267 tuberculous cases were visited, while the supervision of midwives accounted for 1,494 visits.

In addition to the above, regular inspections of maternity homes were made, whilst a large number of special cases were dealt with.

The question of the supervision of private general hospitals is one that will require consideration in the near future.

Under the provisions of the Health Act these hospitals are registered with the local authority, but, unfortunately, the local authority does not possess a staff of officers qualified to supervise such premises. It seems desirable to have registration of these premises effected with the Department so that they may be supervised in the same manner as maternity homes. This matter is to be discussed with the local authorities concerned as early as convenient.

MEAT INSPECTION.

In Appendix H will be found returns showing slaughtering activities in the various areas supervised by the meat inspection service, and also the

extent of condemnation of carcasses, etc., which inspection made necessary.

On consideration of the volume of slaughtering done, it will be noticed that there is a considerable increase in the Fremantle area, a smaller increase in the inspection areas of Northam and Geraldton, but a marked diminution in the number of animals dealt with at Kalgoorlie.

INSPECTION OF IMPORTED FOOD.

Close supervision is maintained of consignments of foodstuffs arriving at Fremantle, a very large proportion of the time of one inspector being given to this duty.

Refrigerated fish (fillet) continues to occupy first place in the attention of the inspector. In 1923 it became necessary to condemn over 24 tons of this commodity, and in 1924 49 tons were condemned.

Amongst other items presented at the principal port for admission to the State, which had to be

rejected as unfit for human consumption, were the following:—

	1923.	1924.
Fruit, dried	385lb.	
Macaroni	...	2 tons 17 cwt.
Fish, tinned	1 ton 3 cwt.	1 ton 4 cwt.
Fish, fresh	...	1,998lbs.
Sausages	600lbs.	...
Vegetables	1,288lbs.	...
Walnuts	4,290lbs.	...
Cheese	100lbs.	56lbs.
Cherries (in syrup)	60galls.	...
Pork	...	978lbs.
Bacon	...	1,213lbs.
Rabbits	180lbs.	867lbs.
Jam	...	234lbs.
Green Ginger	...	336lbs.
Green Yams	...	448lbs.

During 1923 59 samples of foods and 10 of drugs were taken under the terms of the Act, and during 1924 the samples numbered 123 and 2 respectively. These were all examined and reported upon by the Government Analytical Department.

LEGAL PROCEEDINGS.

It was unfortunately necessary to institute proceedings in a number of cases; a summary of these follows:—

Breaches of—	1923.				1924.			
	Cases.	Convictions.	With-drawn.	Fines and Costs.	Cases.	Convictions.	With-drawn.	Fines and Costs.
				£ s. d.				£ s. d.
<i>Health Act.</i>								
For obstruction of officers	...	...	...	...	1	1	...	1 6 0
For opening public building without approval	...	...	...	...	1	1	...	10 3 0
For nuisances	2	2	...	5 4 6	4	4	...	10 6 4
For non-registration of offensive trade	...	...	...	...	7	6	1	10 5 0
For allowing swine to be at large near slaughterhouse	...	...	...	...	1	1	...	3 5 6
For feeding swine on un-cooked offal	1	1	...	2 18 6	2	2	...	5 19 0
For selling unwholesome food	2	2	...	23 8 0	...	...	...	...
For selling food not of nature and quality demanded	3	3	...	8 2 6	3	3	...	19 6 4
For evading inspection of food	...	...	...	...	2	1	1	2 3 0
For non-notification of cases of infectious disease	2	2	...	2 5 0	...	...	...	...
For non-notification of cases of tuberculosis	...	...	...	...	1	1	...	2 3 0
For failure on the part of venereal patients to continue treatment	15	7	7	45 5 6	3	...	3	...
For infecting others with venereal disease	2	1	...	10 15 0	1	1	...	5 2 0
For practising midwifery without being registered	8	4	4	20 5 6	4	4	...	2 12 0
For failure by midwives to notify cases	6	...	6	0 18 0	...	...	...	...
For failure to cleanse verminous children	35	25	3	50 1 0	21	12	9	25 16 0
<i>Bread Act</i>	1	1	...	3 10 0	...	...	...	...
Public Building Regulations	2	2	...	6 10 0	...	...	...	...
Food and Drug Regulations	...	...	...	...	7	2	5	5 6 0
Meat Inspection Regulations	2	1	...	3 12 6	...	...	...	...
Tuberculosis Regulations	1	...	1	...	...	...	...	...
By-laws Regulations	3	3	...	7 4 0	19	15	4	44 7 0

In conclusion, I desire to express my appreciation of the very efficient and loyal service given by all officers under my control, during the period under review.

Whatever success has been achieved in the prevention of disease or in the better care of the sick, has been largely due to their loyalty to me and the anxious care with which each has performed his

allotted task. If there has been failure, then it has not been due to any lack of striving for success on their part.

EVERITT ATKINSON,
M.A., M.D., D.P.H.,

Commissioner of Public Health and Principal Medical Officer.

APPENDIX A.

Government Hospitals.

Hospital	Patients admitted.	Total days in Hospital.	Average number of days in Hospital.	Average number of beds occupied.	Total Cost, excluding D.M.O.	Cost per Patient per day.	Revenue.	Percentage of Revenue to Cost.
1923.								
					£	£ s. d.	£	
Kalgoorlie	908	23,263	25·6	63·7	11,824	0 10 1	3,314	28·02
Northam	526	8,222	15·6	22·5	3,136	0 7 7½	1,128	35·9
Bunbury	225	5,174	22·9	14·1	2,117	0 8 2	1,153	54·4
Narrogin	330	4,904	14·8	13·4	2,356	0 9 7¼	1,355	57·5
Collie	316	6,043	19·1	16·5	2,058	0 6 9½	910	44·2
Katanning	282	4,127	14·6	11·3	1,549	0 7 6	1,345	86·8
Albany	204	4,557	22·3	12·4	2,093	0 9 2	769	36·7
Geraldton	173	3,404	19·6	9·3	1,485	0 8 8½	817	55·01
Wagin	283	3,047	10·7	8·3	1,644	0 10 9¼	781	47·5
York	150	1,837	12·2	5·03	1,680	0 18 3¼	594	35·3
Carnarvon	178	2,996	16·8	8·2	1,844	0 12 3½	583	31·6
Broome	86	1,993	23·1	5·4	1,446	0 14 6	472	32·6
Pinjarra	61	1,041	17·06	2·8	823	0 15 9½	411	49·9
Southern Cross	50	315	6·3	·86	827	2 12 6	194	23·4
Menzies	31	309	9·9	·84	256	0 16 6¾	168	65·6
Coolgardie	...	...	...	...	480	...	169	35·2
Wyndham	48	831	17·3	2·2	915	1 2 0¼	357	39·01
Derby	25	2,163	86·5	5·9	767	0 7 1	269	35·07
Marble Bar	15	730	48·6	2·0	1,157	1 11 8¼	50	4·3
Onslow	35	337	9·6	·92	454	1 6 11¼	259	57·04
Roebourne	94	1,383	14·7	3·7	1,160	0 16 9¼	284	24·4
King Edward	797	9,812	12·3	26·8	4,121	0 8 4¾	3,288	79·7
Wooroloo	243	52,891	217·6	144·9	26,166	0 9 10½	6,264	23·9
1924.								
					£	£ s. d.	£	
Albany	262	4,290	16·3	11·7	2,301	0 10 8½	1,033	44·8
Broome	118	1,919	16·2	5·2	1,329	0 13 10	483	36·3
Bunbury	248	5,737	23·1	15·6	1,940	0 6 9	1,190	61·3
Busselton (10 months)	231	3,276	14·1	10·7	1,589	0 9 8¼	697	43·8
Carnarvon	245	3,301	13·4	9·01	1,712	0 10 4¼	912	53·2
Collie	384	6,036	15·7	16·4	2,232	0 7 4½	1,178	52·7
Coolgardie	...	...	...	...	417	...	156	37·4
Denmark (8 months only)	70	736	10·5	3·01	395	0 10 8¾	146	36·9
Derby (old)	26	3,822	147·0	10·4	760	0 3 11¾	104	13·6
Derby (new) (5 months)	13	167	12·8	1·2	106	1 2 3¾	...	...
Geraldton	206	4,212	20·4	11·5	1,902	0 9 0¼	907	47·6
Kalgoorlie	921	23,850	25·8	65·1	11,354	0 9 6¼	3,656	32·2
Katanning	302	3,839	12·7	10·4	1,535	0 7 11¾	1,170	76·2
Karridale (11 months)	82	1,291	15·7	3·8	864	0 13 4½	202	23·3
Marble Bar	13	684	52·6	1·8	1,067	1 11 2¼	58	5·4
Menzies	43	568	13·2	1·5	374	0 13 2	161	43·04
Margaret River (7 months only)	92	2,035	22·1	9·5	652	0 6 4¾	274	42·02
Narrogin	302	5,060	16·7	13·8	2,258	0 8 11	1,184	52·4
Northam	651	9,807	15·06	26·7	4,039	0 8 2¾	1,573	38·9
Northcliffe (9½ months)	84	903	10·7	3·1	592	0 13 1¼	282	47·6
Onslow	51	807	15·8	2·2	463	0 11 5½	162	34·9
Roebourne	97	1,059	10·9	2·8	981	0 18 6¼	407	41·4
Wagin	305	3,840	12·5	10·4	1,906	0 9 11	875	45·9
Wyndham	60	1,026	17·1	2·8	765	0 14 10¾	204	26·6
York	166	2,258	13·6	6·1	1,355	0 12 0	448	33·06
King Edward	928	10,694	11·5	29·2	4,468	0 8 4¼	3,921	87·7
Wooroloo Sanatorium	231	57,390	248·4	156·8	24,863	0 8 7¾	5,341	21·4

APPENDIX B.
ASSISTED AND PUBLIC HOSPITALS.

Summary and Analysis of Operations for Year ended 31st December, 1923.

Hospital.	Gross Cost of Hospital.	Total Number of Beds.	Number of Staff employed.	Number of Cases admitted.	Total Number of days Treatment given.	Average Number of Beds occupied.	Average Stay of Patients in Hospital.	Cost per Patient per day.	Rate of Subsidy per Patient per day.
	£						days.	£ s. d.	£ s. d.
Beverley	894	11	6	160	1,273	3.4	7.9	0 14 0 ¹ / ₄	0 3 1 ¹ / ₄
Bridgetown	585	9	4	66	877	2.4	13.2	0 13 4	0 3 5 ¹ / ₄
Broad Arrow	122	6	...	...	...	...	...	...	...
Busselton	1,338	10	6	192	2,586	7.08	13.4	0 10 4	0 2 1 ¹ / ₄
Bruce Rock	841	8	4	125	1,817	4.9	14.5	0 9 3	0 0 6 ¹ / ₄
Cue-Day Dawn	1,635	12	5	82	995	2.7	12.1	1 12 10 ¹ / ₄	0 14 0 ¹ / ₄
Dwellingup	995	8	5	69	736	2.01	10.6	1 7 0 ¹ / ₄	0 1 9 ¹ / ₄
Dalwallinu	290	5	2	46	389	1.06	8.4	0 14 10 ¹ / ₄	...
East Kirup	505	2	1	...	...	...	...	...	...
Greenbushes	727	5	3	60	755	2.06	12.5	0 19 3	0 3 11 ¹ / ₄
Jarnadup	1,125	16	8	266	2,108	5.7	7.9	4 10 8	0 2 10
Jarrahdale	1,177	6	3	33	261	.71	7.9	2 10 2 ¹ / ₄	0 7 7 ¹ / ₄
Kellerberrin	1,265	11	7	163	1,967	5.3	12.06	0 12 10 ¹ / ₄	0 1 6 ¹ / ₄
Laverton	477	19	2	10	67	.18	6.7	7 2 4 ¹ / ₂	2 19 8 ¹ / ₄
Leonora	2,810	35	7	181	2,284	69.2	12.6	1 4 7 ¹ / ₄	0 7 0
Lawlers	423	3	1	7	55	.15	7.8	7 13 9 ¹ / ₄	2 14 6 ¹ / ₄
Mornington	862	6	2	8	59	.16	7.3	14 12 2 ¹ / ₄	0 16 11 ¹ / ₄
Merredin	1,319	10	7	136	1,454	3.9	10.6	0 18 1 ¹ / ₂	2 9
Moora	1,241	10	5	161	2,154	5.9	13.3	0 11 6 ¹ / ₄	0 1 4 ¹ / ₂
Mt. Magnet	1,145	10	3	71	892	2.4	12.5	1 5 8	0 6 8 ¹ / ₄
Mt. Morgans	470	18	3	24	272	.74	11.3	1 14 6 ¹ / ₄	0 14 8 ¹ / ₄
Meekatharra	1,628	15	6	72	1,230	3.3	17.08	1 6 5 ¹ / ₂	0 4 10 ¹ / ₂
Nannine	65	10	1	...	...	...	...	...	...
Norseman	938	18	3	33	200	.54	6.06	4 13 9 ¹ / ₂	1 3 0
Sandstone	456	8	2	12	350	.95	29.1	1 6 0 ¹ / ₂	0 8 6 ¹ / ₄
Three Springs	676	5	4	36	440	2.3	12.2	1 10 8 ¹ / ₂	0 4 6 ¹ / ₄
Toodyay	674	8	3	95	1,175	3.2	12.3	0 11 5 ¹ / ₂	0 2 6 ¹ / ₂
Westonia	390	9	1	24	186	.509	7.7	2 1 11	0 17 11 ¹ / ₄
Wiluna	470	7	1	12	107	.29	8.9	4 7 10	1 17 4 ¹ / ₂
Yarloop	1,367	8	4	116	1,496	4.09	12.8	0 18 3 ¹ / ₄	0 0 8
Youanm	330	5	1	8	28	.07	3.5	11 15 8 ¹ / ₄	7 15 0
Perth	54,260	343	247	4,336	98,998	271.2	22.8	0 10 11 ¹ / ₄	0 4 5 ¹ / ₄
Fremantle	14,389	92	58	981	24,066	65.9	24.5	0 11 11 ¹ / ₄	0 4 10 ¹ / ₄
Children's	14,416	126	98	1,576	31,520	86.3	20.	0 10 4 ¹ / ₄	0 3 11 ¹ / ₄

ASSISTED HOSPITALS.

Summary and Analysis of Operations for Year ended 31st December, 1924.

Hospital.	Gross Cost of Hospital.	Total Number of Beds.	Number of Staff employed.	Number of Cases admitted.	Total Number of days Treatment given.	Average Number of Beds occupied.	Average Stay of Patients in Hospital.	Cost per Patient per day.	Rate of Subsidy per Patient per day.
	£						days.	£ s. d.	£ s. d.
Beverley	2,694	*19	8	215	1,999	5.4	9.2	1 6 11 ¹ / ₄	0 2 0
Brookton	465	3	2	36	453	1.2	12.5	1 0 6 ¹ / ₄	...
Boyup Brook	1,337	13	5	70	463	1.2	6.6	2 17 9	...
Bridgetown	635	8	4	49	579	1.5	11.8	1 1 11	0 5 2
Broad Arrow	118	...	...	...	...	...	...	...	...
Bruce Rock	1,021	8	4	136	1,609	4.4	11.8	0 12 8 ¹ / ₄	0 1 2 ³ / ₄
Cue-Day Dawn	2,015	17	4	91	876	2.4	9.6	2 6 0	0 15 11 ¹ / ₄
Dwellingup	958	9	4	107	933	2.5	8.7	1 0 6 ¹ / ₄	0 2 1 ¹ / ₂
Dalwallinu	549	6	2	64	582	1.5	9.09	0 18 6 ¹ / ₂	0 1 8 ¹ / ₂
East Kirup	799	...	2	...	...	...	...	...	...
Greenbushes	654	5	5	54	560	1.5	10.3	1 3 4 ¹ / ₄	0 5 4 ¹ / ₂
Goomalling	1,322	8	4	239	1,846	5.05	7.7	0 14 4	0 0 9 ¹ / ₄
Jarnadup	1,430	15	8	280	2,112	5.7	7.5	0 13 6 ¹ / ₄	0 2 10
Jarrahdale	1,523	7	4	39	378	1.03	9.7	4 0 6 ¹ / ₄	0 5 3 ¹ / ₄
Kellerberrin	1,194	10	5	155	1,824	4.9	11.17	0 13 1	0 1 7 ¹ / ₂
Laverton	480	19	2	21	220	.602	10.4	2 3 7 ¹ / ₂	0 18 2
Lawlers	487	3	2	11	107	.29	9.7	4 11 0 ¹ / ₄	1 8 0 ¹ / ₄
Leonora	2,783	30	7	181	2,566	7.03	14.17	1 1 8 ¹ / ₄	0 6 2 ³ / ₄
Mornington	1,413	6	4	42	360	.98	8.5	3 18 6	0 2 9 ¹ / ₄
Merredin	1,264	10	9	140	1,468	4.02	10.4	0 17 2 ¹ / ₂	0 3 4 ³ / ₄
Moora	1,117	10	9	145	2,105	5.7	14.5	0 10 7 ¹ / ₄	0 1 5
Mt. Morgans	427	5	4	22	181	.49	8.2	2 7 2	1 2 1
Mt. Magnet	1,291	10	4	85	875	2.3	10.2	1 9 6	0 6 10 ¹ / ₄
Meekatharra	1,565	18	6	90	1,184	3.2	13.1	1 6 5	0 5 0 ¹ / ₄
Norseman	1,022	12	3	40	463	1.2	11.5	2 4 1 ¹ / ₂	0 10 9 ¹ / ₂
Nannine	70	11	1	...	...	...	...	...	...
Ravensthorpe	447	10	2	11	328	.89	29.8	1 7 3	...
Sandstone	475	8	2	18	170	.46	9.4	2 15 10 ¹ / ₂	0 17 7 ³ / ₄
Toodyay	656	8	3	93	1,004	2.7	10.8	0 13 0 ¹ / ₄	0 2 11 ¹ / ₄
Three Springs	491	6	2	60	1,027	2.8	17.1	0 9 6 ¹ / ₄	0 2 11
Westonia	404	9	1	46	556	1.5	12.08	0 14 6 ¹ / ₄	0 5 4 ¹ / ₂
Wyalcatchem	2,229	9	3	134	1,569	4.3	11.7	1 8 4 ¹ / ₄	0 0 11 ¹ / ₄
Wickepin	540	4	2	78	700	1.9	8.9	0 15 5	0 1 5
Wiluna	773	6	2	19	239	.65	12.5	3 4 8	0 16 8 ¹ / ₄
Woodanilling	114	4	2	60	300	.82	5.0	0 7 7	0 3 4 ¹ / ₄
Youanmi	284	5	1	7	76	.208	10.8	3 14 8 ¹ / ₄	2 12 7 ¹ / ₄
Yarloop	1,638	8	6	124	1,123	3.07	9.05	1 9 2	0 1 4
Perth	60,607	420	272	5,537	131,141	359.2	23.6	0 9 2 ¹ / ₄	0 3 4 ¹ / ₄
Fremantle	13,986	92	60	1,090	25,225	69.1	23.1	0 11 1	0 4 4 ¹ / ₄
Children's	16,509	126	88	1,602	33,642	92.1	21.0	0 9 9 ¹ / ₄	0 3 6 ¹ / ₂

* For six months there were only 11 beds.

APPENDIX B

TABLE II.—Statement of Revenue and Expenditure of Public Assisted Hospitals for Year ended 31st December, 1923.

Hospital.	REVENUE.										EXPENDITURE.										Total.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	From Government.					Administration.					Hospital.					Miscellaneous.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	Subsidy.		Special Grants.			Subscriptions, donations, capital expenditure (e.g., building and equipment).		Capital expenditure on buildings.		Total.		Secretary's Salary.		Office.		Printing, etc.		Medical Officer.		Matron.		Nurses.		Domestic Orderlies.		Other Salaries.		Provisions.		Bedding and Clothing.		Uniforms.		Drugs and Dressings.		Instruments and Appliances.		Furniture.		Fuel, Light, and Water.		Washing.		Repairs to Premises.		Travelling Expenses.		Hardware.		Stimulants.		Postage, Tele. Stationery.		Domestic Requisites.		Transport.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	Out-Patients' Fees.	Other Revenue.	Subsidy.	Special Grants.	Subscriptions, donations, capital expenditure (e.g., building and equipment).	Capital expenditure on buildings.	Total.	Secretary's Salary.	Office.	Printing, etc.	Medical Officer.	Matron.	Nurses.	Domestic Orderlies.	Other Salaries.	Provisions.	Bedding and Clothing.	Uniforms.	Drugs and Dressings.	Instruments and Appliances.		Furniture.	Fuel, Light, and Water.	Washing.	Repairs to Premises.	Travelling Expenses.	Hardware.	Stimulants.	Postage, Tele. Stationery.	Domestic Requisites.	Transport.	Miscellaneous.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Beverley	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	

* £370 on furniture.

† Total Salaries.

APPENDIX B.—continued.

TABLE II.—Statement of Revenue and Expenditure of Public Assisted Hospitals for Year ended 31st December, 1924.

REVENUE.										EXPENDITURE.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
Hospital.	From Government.				Out-Patients' Fees.	Maintenance Fees.	Special Efforts.	Administration.		Salaries.						Hospital.										Total.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	Subsidy.		Special Grants.	Subscriptions, donations, capital expenditure (e.g., equipment).				Secretary's Salary.	Office.	Printing, etc.	Medical Officer.	Matron.	Nurses.	Domestic Orderlies.	Other Salaries.	Provisions.	Bedding and Clothing.	Uniforms.	Drugs and Dressings.	Instruments and Appliances.	Furniture.	Fuel, Light, and Water.	Washing.	Repairs to Premises.	Travelling Expenses.		Hardware.	Stimulants.	Postage, Telephone and Stationery.	Domestic Requisites.	Transport.	Miscellaneous.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Beverley	63	77	143	856	...	35	200	807	2,619	65	...	44	...	103	245	65	60	...	...	...	104	...	416	87	...	19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...</

^a Of this amount £1,197 was expended on new buildings. ^b Of this amount £490 represents building account. ^c £25 paid for treatment at other Hospitals. ^d £322 paid for treatment at other Hospitals. ^e £121 paid for treatment at other Hospitals. ^f Of this amount, £11,677 = payments made by the Government Departments.

APPENDIX C.

TABLE 1.—Notification of each Type of Infectious Disease received by the Department of Public Health for each month of the Year ended 31st December, 1923.

Months.	Diphtheria.	Typhoid Fever (Enteric).	Pulmonary Tuberculosis.	Scarlet Fever.	Erysipelas.	Purulent Ophthalmia.	Malaria.	Beri Beri.	Dengue Fever.	Dysentery.	Puerperal Sepsis.	Acute anterior Poliomyelitis.	Cerebro spinal Meningitis.	Leprosy.	Ophthalmia Neonatorum.
January ...	31	24	45	13	2	11	2	...	1	1	4	1	...	1	...
February ...	35	27	32	5	5	5	2	2	...	...	1	1	...	...	1
March ...	44	43	30	2	...	2	1	...	...	...	1	1	...	...	...
April ...	54	42	37	6	5	3	3	1	...	...	...	1	...	...	...
May ...	41	34	29	6	8	...	3	2	...	3	...	...	...	1	...
June ...	61	17	30	2	2	2	3	1	2	1	2	2	...	...	...
July ...	50	4	29	7	2	1	4	7	...	1	3	...	...	...	...
August ...	31	5	23	5	2	...	...	1	...	...	1	1	...	...	1
September ...	32	6	22	6	6	1	2	...	...	...	1	...	1	...	...
October ...	48	8	27	4	1	1	2	...	...	...	2	1	...	...	...
November ...	42	11	27	3	5	...	1	...	...	...	3	...	...	...	...
December ...	35	30	30	3	2	1	...	1	...	...	...	...	2	...	1
Totals ...	504	251	361	62	40	27	23	15	3	6	18	8	3	2	3

TABLE 2.—Notification of each Type of Infectious Disease received by the Department of Public Health for each week of the Year ended 31st December, 1923.

Weeks.	Diphtheria.	Typhoid Fever (Enteric).	Pulmonary Tuberculosis.	Scarlet Fever.	Erysipelas.	Purulent Ophthalmia.	Malaria.	Beri Beri.	Dengue Fever.	Dysentery.	Puerperal sepsis.	Acute Anterior Poliomyelitis.	Cerebro spinal Meningitis.	Leprosy.	Ophthalmia Neonatorum.
First week ...	6	14	9	3	...	...	...	...	...	...	1	1	...	1	...
Second week ...	8	3	7	5	1	4	...	...	1	...	1	...	...	...	...
Third week ...	7	1	12	2	...	4	1	...	...	...	2	...	...	...	...
Fourth week ...	10	2	14	3	1	2	...	...	...	1	...	...	...	...	...
Fifth week ...	3	7	5	1	...	1	1	...	...	...	...	...	...	...	...
Sixth week ...	9	6	8	1	1	4	1	...	...	...	...	...	...	...	...
Seventh week ...	9	4	14	1	1	...	...	...	...	...	1	1	...	...	...
Eighth week ...	11	9	4	1	2	1	...	2	...	...	...	...	...	...	1
Ninth week ...	8	6	6	1	1	...	1	...	...	...	...	...	...	...	...
Tenth week ...	16	16	8	1	...	1	1	...	...	...	1	...	...	...	...
Eleventh week ...	13	9	9	1	...	1	...	...	...	...	...	1	...	...	...
Twelfth week ...	10	17	11	...	...	...	...	...	...	...	...	...	...	...	...
Thirteenth week ...	13	3	8	2	3	...	...	...	...	...	...	...	...	...	...
Fourteenth week ...	9	15	7	...	...	1	1	...	...	...	...	...	...	...	...
Fifteenth week ...	12	6	6	1	1	1	...	1	...	...	...	...	...	...	...
Sixteenth week ...	11	6	5	1	...	1	...	...	...	...	...	...	...	...	...
Seventeenth week ...	9	12	11	2	1	...	2	...	...	...	...	1	...	...	...
Eighteenth week ...	9	5	6	...	3	...	...	...	...	...	...	...	...	...	...
Nineteenth week ...	9	14	4	1	2	...	2	2	...	1	...	...	...	1	...
Twentieth week ...	12	11	6	1	1	...	1	...	...	1	...	...	...	...	...
Twenty-first week ...	11	4	13	4	2	...	...	1	...	1	...	...	...	...	...
Twenty-second week ...	13	6	9	2	...	...	1	1	2	...	...	...	...	...	...
Twenty-third week ...	12	5	10	...	1	...	1	...	...	1	...	2	...	...	...
Twenty-fourth week ...	16	5	7	...	1	...	1	...	...	...	2	...	...	...	...
Twenty-fifth week ...	20	1	4	...	...	1	...	...	...	...	...	...	...	...	...
Twenty-sixth week ...	10	2	6	...	...	...	1	3	...	1	1	...	...	...	...
Twenty-seventh week ...	8	1	5	3	...	...	1	...	...	...	...	...	...	...	...
Twenty-eighth week ...	8	...	5	2	1	...	2	4	...	...	...	...	...	...	...
Twenty-ninth week ...	8	...	5	1	...	1	...	...	...	...	1	...	...	...	...
Thirtieth week ...	14	1	4	...	1	...	...	...	...	...	1	...	...	...	...
Thirty-first week ...	8	...	7	1	2	...	...	...	...	...	...	...	...	...	...
Thirty-second week ...	2	2	8	...	...	...	...	...	...	...	...	...	...	...	...
Thirty-third week ...	8	2	7	2	...	...	...	...	...	...	...	1	...	...	...
Thirty-fourth week ...	7	1	3	3	...	...	...	1	...	...	...	...	...	...	...
Thirty-fifth week ...	11	...	2	...	...	...	...	...	...	...	2	...	...	...	1
Thirty-sixth week ...	15	1	6	3	1	...	...	...	...	...	...	...	...	...	...
Thirty-seventh week ...	1	1	7	...	2	1	1	...	...	...	...	...	...	...	...
Thirty-eighth week ...	5	1	3	...	1	...	...	...	...	...	...	...	...	...	...
Thirty-ninth week ...	8	3	6	3	2	...	1	...	...	...	...	...	...	...	...
Fortieth week ...	13	2	10	1	...	...	...	...	...	...	1	...	...	...	...
Forty-first week ...	13	1	1	...	1	1	...	...	...	...	...	1	...	...	...
Forty-second week ...	8	2	2	...	...	...	2	...	...	...	1	...	...	...	...
Forty-third week ...	5	3	6	3	...	...	...	...	...	...	...	...	...	...	...
Forty-fourth week ...	13	1	7	...	1	...	...	...	...	...	1	...	...	...	...
Forty-fifth week ...	15	...	4	2	2	...	...	...	...	...	...	...	...	...	...
Forty-sixth week ...	13	5	8	1	...	...	...	...	...	...	1	...	...	...	...
Forty-seventh week ...	5	2	6	...	1	...	...	...	...	...	1	...	...	...	...
Forty-eighth week ...	6	4	8	...	1	...	1	...	...	...	...	...	...	...	...
Forty-ninth week ...	11	5	8	2	1	...	...	...	...	...	...	...	1	...	...
Fiftieth week ...	9	3	6	1	...	...	...	...	...	...	...	...	...	...	...
Fifty-first week ...	6	12	11	...	...	1	...	...	...	...	...	...	...	...	1
Fifty-second week ...	8	9	4	...	1	...	...	1	...	...	...	...	1	...	...
Grand Total	504	251	361	62	40	27	23	15	3	6	18	8	3	2	3

TABLE 3.—Age and Sex Distribution of Cases of Diphtheria, Typhoid Fever (Enteric), Pulmonary Tuberculosis, and Scarlet Fever notified to the Department of Public Health for each Month of the Year ended 31st December, 1923.

MONTH.	AGES IN YEARS.																	ALL AGES.	
	0-1																	Age not stated.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Total.
DIPHTHERIA.																			
January	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	31
February	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	35
March	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	44
April	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	54
May	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	41
June	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	61
July	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	50
August	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	31
September	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	32
October	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	48
November	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	42
December	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	35
	6	5	21	20	17	25	13	14	19	20	13	14	11	12	7	14	25	36	15
TYPHOID FEVER (ENTERIC).																			
January	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	24
February	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	27
March	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	43
April	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	42
May	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	34
June	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	17
July	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
August	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5
September	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6
October	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8
November	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11
December	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	30
	...	...	2	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	251
PULMONARY TUBERCULOSIS.																			
January	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	45
February	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	32
March	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	30
April	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	37
May	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	29
June	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	30
July	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	29
August	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	23
September	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	22
October	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	27
November	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	27
December	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	30
	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	361
SCARLET FEVER.																			
January	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13
February	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5
March	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
April	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
May	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
June	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6
July	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6
August	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7
September	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5
October	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6
November	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
December	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
	1	...	1	...	1	...	1	...	2	...	1	...	2	...	1	...	...	...	62

APPENDIX C.—continued.

TABLE 4.—Table showing the Incidence in various Districts of each Type of Infectious Disease for the Year ended 31st December, 1923.

Health District.	Diphtheria.	Typhoid Fever (Enteric).	Pulmonary Tuberculosis.	Scarlet Fever.	Erysipelas.	Purulent Ophthalmia.	Malaria.	Beri Beri.	Dengue Fever.	Dysentery.	Puerperal Sepsis.	Poliomyelitis.	Cerebro Spinal Meningitis.	Leprosy.	Ophthalmia Neonatorum.
Fremantle ...	3	2	23	5	...	1	...	1	...	...	1	1	...	...	1
Fremantle Road Board	9	6	8	...	...	...	...	...	...	...	...	...	...	...	...
Fremantle, East ...	8	3	4	2	...	...	...	...	...	...	1	...	...	...	...
Fremantle, North ...	...	2	...	...	1	...	...	...	...	...	...	...	...	...	...
Melville ...	3	1	...	2	...	...	...	...	...	...	...	1	...	...	...
Cottesloe Beach ...	3	1	3	1	3	...	...	...	...	...	...	...	...	...	...
Cottesloe ...	5	4	4	3	...	1	...	...	...	...	...	...	...	...	...
Peppermint Grove ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Claremont ...	5	6	15	...	...	...	...	...	...	...	...	...	...	...	...
Claremont Road Board	3	1	1	...	...	...	...	...	...	...	4	3	...	...	1
Subiaco ...	59	12	16	6	1	2	1	...	1	2	4	1	2	...	...
Perth ...	185	69	94	16	7	1	...	...	...	...	...	...	...	...	...
Perth, South ...	3	2	2	...	...	...	...	...	...	...	...	...	...	...	...
Osborne Park ...	8	1	2	...	...	...	...	...	...	...	...	...	...	...	...
Wanneroo ...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...
Maylands ...	4	4	9	...	...	...	...	...	...	...	...	...	...	...	...
Bayswater ...	11	...	3	...	1	...	...	...	...	...	...	...	...	...	...
Belmont ...	1	...	2	...	...	...	...	...	...	...	...	...	...	...	...
Guildford ...	...	2	1	...	...	...	1	...	...	...	...	...	...	...	...
Bassendean ...	...	1	6	...	...	...	...	...	...	...	...	...	...	...	...
Midland Junction ...	7	1	5	...	3	...	...	...	...	...	...	...	...	...	...
Darling Range ...	11	7	12	1	3	...	...	...	...	...	...	...	...	...	...
Queen's Park ...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...
Gosnells ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Armadale ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jandakot ...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Northam ...	13	2	8	2	1	...	...	...	...	...	1	1	1	...	...
Dowerin ...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...
Wyalatchem ...	4	3	1	...	...	...	...	...	...	...	...	...	...	...	...
Merredin ...	1	...	6	...	...	...	...	...	...	...	...	...	...	...	...
Cunderdin ...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...
Kellerberrin ...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...
Tammin ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Southern Cross ...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Westonia ...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Coolgardie ...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Boulder ...	17	16	23	8	...	...	...	...	...	1	...	...	...	...	...
Kalgoorlie ...	15	27	13	8	...	...	...	...	...	...	...	...	...	...	...
Kalgoorlie Road Board	3	2	6	1	1	...	...	...	...	...	...	...	...	...	...
Kanowna ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Menzies ...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...
Leonora ...	...	...	3	...	1	...	...	...	...	...	...	...	...	...	...
York ...	...	...	1	...	1	...	...	...	...	1	...	...	...	...	...
Bruce Rock ...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...
Beverley ...	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...
Brookton ...	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Pingelly ...	7	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Corrigin ...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Narrogin ...	15	...	2	1	3	...	...	...	...	...	...	...	...	...	...
Jitaring ...	1	1	2	...	1	...	...	...	...	...	...	...	...	...	...
Wagin ...	4	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Dumbleyung ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Katanning ...	8	1	2	...	...	1	...	...	...	...	...	...	...	...	...
Kojonup ...	...	...	3	1	...	...	...	...	...	...	...	...	...	...	...
Williams ...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Guowangerup ...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Tambellup ...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Mt. Barker ...	...	10	1	...	...	...	...	...	...	...	...	...	...	...	...
Albany ...	26	2	6	...	1	...	...	...	...	...	3	...	...	...	...
Denmark ...	...	...	2	...	5	...	1	...	...	...	...	...	...	...	...
Mundijong ...	4	1	3	...	...	...	...	...	...	...	1	...	...	...	...
Pinjarra ...	3	5	...	...	...	...	...	...	...	...	...	...	...	...	...
North Dandalup ...	...	4	1	...	...	...	...	...	...	...	...	...	...	...	...
Dwellingup ...	7	1	1	...	...	...	...	...	...	...	1	1	...	...	...
Pindalup ...	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Capel ...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Harvey ...	2	2	2	...	...	...	...	...	...	...	...	...	...	...	...
Yarloop ...	2	4	...	1	...	...	...	...	...	...	...	...	...	...	...
Bunbury ...	3	1	4	...	...	...	...	...	...	...	1	...	...	...	1
Donnybrook ...	1	...	2	...	...	...	...	...	...	...	...	...	...	...	...
Bridgetown ...	...	6	1	...	...	...	...	...	...	...	...	...	...	...	...
Jarndup ...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Busselton ...	4	4	3	...	...	...	...	...	...	...	...	...	...	...	...
Collie ...	...	1	4	...	1	...	...	...	...	...	...	...	...	...	...
Greenbushes ...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...
Balingup ...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Nannup ...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Brunswick Junction ...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gingin ...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...
Mingenew ...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Walkaway ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Geraldton ...	4	13	6	...	1	...	...	...	...	...	...	...	...	...	...
Northampton ...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Mullewa ...	1	...	2	...	...	...	...	...	...	...	...	...	...	...	...
Yalgoo ...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Mt. Magnet ...	1	3	3	1	...	...	...	...	...	...	...	...	...	...	...
Youanmi ...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Cue-Day Dawn ...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Meekatharra ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Goomalling ...	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Wongan Hills ...	6	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Pithara ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Dalwallinu ...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Carnarvon ...	...	1	1	...	...	...	...	...	...	...	1	...	...	...	...
Roebourne ...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Port Hedland ...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...
Broome ...	...	2	5	...	...	20	4	14	...	1	...	...	...	2	...
Wyndham ...	...	...	2	...	...	...	15	...	2	...	...	...	...	...	...
Ravensthorpe ...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
	504	251	361	62	40	27	23	15	3	6	18	8	3	2	3

APPENDIX C—continued.

TABLE 1.—Notification of each type of Infectious Disease received by the Department of Public Health for each month of the year ended 31st December, 1924.

Months.	Diph-theria.	Typhoid Fever.	Pul-monary Tubercu-losis.	Scarlet Fever.	Erysi-pelas.	Beri Beri.	Malaria.	Puru-lent Ophth-almia.	Dysen-tery.	Puer-peral Sepsis.	Infantile Para-lysis.	Leprosy.	Cerebro Spinal Menin-gitis.	Low Fever.
January	40	26	33	3	2	2	...	3	...	...	...	...	...	...
February	40	31	38	...	1	6	6	...	2	...	...	...	...	...
March	36	27	42	3	7	1	2	...	...	2	1	...	...	...
April	66	30	12	5	5	5	2	1	1	1	1	...	...	...
May	56	33	15	11	5	...	4	4	2	2	...	1	...	...
June	46	24	28	12	3	3	1	...	1	2	...	...	...	...
July	37	10	27	3	6	4	2	1	...	1	...	1	...	...
August	44	6	40	8	7	2	2	...	2	2	...	...	...	...
September	38	4	35	6	2	1	5	...	4	1	...	...	1	...
October	37	7	37	4	5	3	2	...	...	3	...	...	1	1
November	32	5	43	4	9	2	2	2	2	2	...	...	...	...
December	39	17	31	7	5	4	1	...	1	...	1	...	...	...
Total	511	220	381	66	57	33	29	11	15	16	3	2	2	1

TABLE 2.—Notification of each type of Infectious Disease received by the Department of Public Health for each week of the year ended 31st December, 1924.

Weeks.	Diph-theria.	Typhoid Fever.	Pul-monary Tubercu-losis.	Scarlet Fever.	Erysi-pelas.	Beri Beri.	Malaria.	Puru-lent Ophth-almia.	Dysen-tery.	Puer-peral Sepsis.	Infantile Para-lysis.	Leprosy.	Cerebro Spinal Menin-gitis.	Low Fever.
First week	6	...	5	1	...	...	...	...	...	...	...	...	...	...
Second week	5	5	10	...	...	...	...	2	...	...	...	...	...	...
Third week	12	6	8	1	...	2	...	1	...	...	...	...	...	...
Fourth week	11	5	6	1	1	...	...	...	...	...	...	...	...	...
Fifth week	7	12	6	...	1	...	...	...	...	...	...	...	...	...
Sixth week	7	8	8	3	...	1	1	...	...	...	...	...	...	...
Seventh week	15	6	9	...	...	1	1	...	1	...	...	...	...	...
Eighth week	8	9	10	...	1	2	3	...	...	...	...	...	...	...
Ninth week	12	8	11	...	...	3	1	...	1	...	...	...	...	...
Tenth week	11	8	10	...	1	...	1	...	...	...	...	...	...	...
Eleventh week	11	6	6	...	2	...	...	...	...	...	...	...	...	...
Twelfth week	7	6	10	...	...	...	...	...	...	...	...	...	...	...
Thirteenth week	3	5	11	...	4	...	1	...	...	2	...	...	...	...
Fourteenth week	8	2	12	1	1	2	4	...	...	1	1	...	...	...
Fifteenth week	13	4	3	1	3	...	2	...	...	...	...	...	...	...
Sixteenth week	23	16	...	1	1	2	...	...	...	...	1	...	...	...
Seventeenth week	12	7	...	1	...	...	...	1	...	...	...	...	...	...
Eighteenth week	22	9	...	2	...	1	...	...	1	...	...	...	...	...
Nineteenth week	10	10	...	8	2	...	...	1	1	...	...	...	...	...
Twentieth week	12	6	1	1	...	...	...	2	1	...	...	...	...	...
Twenty-first week	21	3	4	1	2	...	...	1	...	...	...	1	...	...
Twenty-second week	2	6	8	...	...	...	...	...	...	...	...	...	...	...
Twenty-third week	11	10	8	3	...	1	...	...	...	2	...	...	...	...
Twenty-fourth week	12	6	8	4	1	...	...	...	...	1	...	...	...	...
Twenty-fifth week	18	3	4	4	...	1	...	...	1	...	...	...	...	...
Twenty-sixth week	7	4	8	1	3	1	...	...	...	...	...	...	...	...
Twenty-seventh week	12	4	6	1	3	...	1	...	...	1	...	...	...	...
Twenty-eighth week	9	3	7	...	...	...	1	...	...	1	...	...	...	...
Twenty-ninth week	3	...	9	1	...	1	1	...	...	...	...	1	...	...
Thirtieth week	10	2	2	1	2	3	...	...	...	...	...	...	...	...
Thirty-first week	9	3	7	...	1	...	...	...	...	...	...	...	...	...
Thirty-second week	14	...	8	3	...	1	...	...	2	...	...	...	...	...
Thirty-third week	10	2	5	1	3	...	...	1	...	2	...	...	...	...
Thirty-fourth week	4	2	8	2	1	1	...	...	...	...	...	...	...	...
Thirty-fifth week	13	1	15	2	3	...	1	...	...	...	...	...	...	...
Thirty-sixth week	8	...	12	...	...	1	1	...	3	...	...	...	...	...
Thirty-seventh week	8	2	6	1	1	...	3	...	...	...	...	...	...	...
Thirty-eighth week	10	1	3	3	...	...	...	...	...	...	...	...	...	...
Thirty-ninth week	11	1	11	2	1	...	1	...	1	1	...	...	1	...
Fortieth week	3	1	9	...	...	...	...	...	...	...	...	...	...	...
Forty-first week	10	1	7	1	3	1	1	...	...	2	...	...	...	1
Forty-second week	10	...	8	1	2	...	1	...	...	...	...	...	1	...
Forty-third week	6	2	6	1	...	...	...	...	...	1	...	...	...	...
Forty-fourth week	12	3	10	1	...	2	1	...	...	...	...	...	...	...
Forty-fifth week	3	...	8	2	1	...	...	...	1	...	...	...	...	...
Forty-sixth week	10	2	7	...	3	1	1	...	...	1	...	...	...	...
Forty-seventh week	11	1	8	2	2	...	...	...	...	...	...	...	...	...
Forty-eighth week	5	2	8	...	3	1	...	2	1	...	...	...	...	...
Forty-ninth week	9	2	22	2	...	...	...	...	...	...	...	...	...	...
Fiftieth week	5	6	9	3	1	1	...	...	...	...	...	...	...	...
Fifty-first week	9	4	7	2	...	2	...	...	...	...	...	...	...	...
Fifty-second week	16	5	5	...	4	...	1	...	1	1	1	...	...	...
Total	511	220	381	66	57	33	29	11	15	16	3	2	2	1

APPENDIX C.—continued.

TABLE 4.—Table showing the Incidence in various Districts of each type of Infectious Disease, for the Year ended 31st December, 1924.

Health District.	Diphtheria.	Typhoid Fever.	Pulmonary Tuberculosis.	Scarlet Fever.	Erysipelas.	Beri Beri.	Malaria.	Purulent Ophthalmia.	Dysentery.	Puerperal Sepsis.	Infantile Paralysis.	Leprosy.	Cerebro Spinal Meningitis.	Low Fever.
Fremantle ...	19	1	18	3	1	...	...	...	1	1	...	...	...	...
Fremantle Road Board	2	2	3	2	...	...	...	...	...	...	...	...	...	...
Fremantle, East ...	1	1	13	1	1	...	...	...	...	...	...	...	...	1
Fremantle, North ...	...	...	6	...	...	...	...	...	...	...	...	...	...	...
Melville ...	3	...	2	...	1	...	...	...	...	1	...	...	...	...
Cottesloe Beach ...	4	...	3	...	1	...	...	...	...	...	...	...	...	...
Cottesloe ...	1	1	2	1	...	...	...	...	...	...	...	...	...	...
Peppermint Grove ...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Claremont ...	8	1	14	1	4	...	...	...	2	...	...	...	...	...
Claremont Road Board	3	2	1	...	...	...	...	...	...	...	...	...	...	...
Subiaco ...	70	29	17	4	3	...	...	2	...	...	...	...	...	...
Perth ...	181	81	132	30	17	...	2	3	5	4	...	...	...	...
Perth, South ...	3	...	1	...	...	...	...	...	...	...	...	...	...	...
Maylands ...	8	11	9	5	2	...	...	...	1	5	...	...	...	...
Bayswater ...	6	2	5	1	...	...	...	...	...	...	1	...	...	...
Osborne Park ...	4	1	3	...	...	...	1	...	...	...	...	...	...	...
Belmont ...	5	...	1	...	...	...	...	...	...	...	...	...	...	...
Guildford ...	5	...	2	...	...	...	...	...	...	1	...	...	...	...
Bassendean ...	7	1	6	...	2	...	...	...	...	...	...	...	...	...
Midland Junction ...	12	2	5	2	3	...	...	...	1	...	...	...	...	...
Darling Range ...	10	6	11	2	1	...	...	...	...	...	...	...	1	...
Queen's Park ...	8	2	5	1	...	...	...	...	...	...	...	...	...	...
Gosnells ...	1	2	2	...	...	...	...	...	...	...	...	...	...	...
Armadale ...	2	1	...	1	...	...	...	...	...	...	...	...	...	...
Jandakot ...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Wooroloo ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Northam ...	11	3	4	...	...	...	...	...	...	...	...	...	...	...
Goomalling ...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Dowerin ...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Wyalcatchen ...	...	1	1	...	...	...	...	...	...	...	...	...	...	...
Merredin ...	...	1	3	...	...	...	...	...	...	...	...	...	...	...
Meckering ...	1	...	...	...	2	...	...	...	...	...	...	...	...	...
Cunderdin ...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Kellerberrin ...	3	2	2	...	4	...	...	...	...	...	...	...	...	...
Tamulin ...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Southern Cross ...	2	...	3	...	...	...	...	...	...	...	...	...	...	...
Kalgoorlie ...	30	8	17	2	1	...	...	...	...	1	...	...	...	...
Kalgoorlie Road Board	1	4	1	...	...	...	...	...	...	...	...	...	...	...
Boulder ...	11	4	20	...	3	...	...	...	...	...	...	...	...	...
Menzies ...	...	...	2	...	...	...	...	...	...	...	...	...	...	...
Leonora ...	1	1	4	...	...	...	...	...	...	...	...	...	...	...
Laverton ...	...	...	3	...	...	...	...	...	...	...	...	...	...	...
Lawlers ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
York ...	...	...	3	...	2	...	...	...	...	...	...	...	...	...
Bruce Rock ...	11	...	...	...	...	...	...	...	...	...	...	...	...	...
Quairading ...	...	...	1	1	...	...	...	...	...	...	...	...	...	...
Beverley ...	2	1	1	...	...	...	...	...	...	...	...	...	...	...
Brookton ...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Popanyinning ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Corralgin ...	...	2	2	...	...	...	...	...	...	...	...	...	...	...
Narrogin ...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Wickepin ...	...	...	2	...	...	...	1	...	...	...	...	...	...	...
Jitarning ...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Wagin ...	4	1	1	...	...	...	...	...	...	...	...	...	...	...
Dumbleyung ...	...	...	2	...	...	...	...	...	...	...	...	...	...	...
Woodanilling ...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Katanning ...	1	...	...	...	1	...	...	...	...	...	...	...	...	...
Broomehill ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kojonup ...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Gnowangerup ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Tambellup ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...
Mt. Barker ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Albany ...	13	3	2	1	...	...	...	...	...	...	...	...	...	...
Denmark ...	2	3	2	...	2	...	3	...	...	...	...	...	...	...
Mundijong ...	4	3	3	...	...	...	...	...	...	...	...	...	...	...
Pinjarra ...	2	2	...	1	...	...	...	...	...	...	...	...	...	...
North Dandalup ...	...	1	...	...	...	...	...	...	...	1	...	...	...	...
Dwellingup ...	2	...	...	1	1	...	...	...	...	...	...	...	...	...
Pindalup ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Capel ...	3	...	...	...	...	...	...	...	...	...	...	...	...	...
Harvey ...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Yarloop ...	9	1	...	1	...	...	...	...	...	...	...	...	...	...
Bunbury ...	2	1	...	...	...	...	...	...	...	...	...	...	1	...
Donnybrook ...	...	...	2	...	...	...	...	...	...	...	...	...	...	...
Bridgetown ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Jarnadup ...	...	1	...	4	3	...	...	...	...	...	...	...	...	...
Busselton ...	2	1	2	...	...	...	...	...	...	...	2	...	...	...
Collie ...	7	1	5	...	...	...	...	...	...	...	...	...	...	...
Greenbushes ...	...	1	1	...	...	...	...	...	...	...	...	...	...	...
Balingup ...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Brunswick Junction ...	...	2	...	...	...	...	...	...	...	...	...	...	...	...
Gingin ...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Moora ...	...	...	2	...	...	...	...	...	...	1	...	...	...	...
Three Springs ...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Mingenew ...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Greenough ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Walkaway ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Geraldton ...	6	15	3	...	...	...	...	...	...	1	...	...	...	...
Northampton ...	...	3	5	...	...	...	...	...	...	...	...	...	...	...
Mullewa ...	...	...	2	...	...	...	1	...	...	...	...	...	...	...
Mt. Magnet ...	2	2	2	...	...	...	...	...	2	...	...	...	...	...
Youanmi ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Cue-Day Dawn ...	...	...	2	...	...	...	...	...	...	...	...	...	...	...
Meekatharra ...	...	2	1	...	...	...	...	...	...	...	...	...	...	...
Wongan Hills ...	1	...	1	...	1	...	...	...	...	...	...	...	...	...
Pitharra ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Carnarvon ...	...	...	3	...	...	...	...	...	...	...	...	...	...	...
Broome ...	...	...	2	...	...	32	8	6	2	...	...	2	...	...
Derby ...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Wyndham ...	...	...	...	...	...	1	13	...	...	...	...	...	...	...
Total ...	511	220	381	66	57	33	29	11	15	16	3	2	2	1

APPENDIX D.
VENEREAL DISEASE.

TABLE 1.—*Twelve Months ended 31st December, 1923.*
Summary of Notifications.

Disease.				Males.	Females.	Total New Cases (both sexes).	Total Notifications Received.
Syphilis—	Primary	...	...	38	5	43	50
	Secondary	...	...	10	8	18	26
	Tertiary	...	...	30	5	35	53
	Congenital	...	...	3	1	4	4
Total				81	19	100	133
Gonorrhœa				508	40	548	668
Chancroid (soft Chancre)				42	...	42	45
Granuloma				1	8	9	11
Gonorrhœal Ophthalmia				...	1	1	1
Grand Total				632	68	700	858

TABLE 2.—*Table showing Incidence of Venereal Disease in Five-year Age Periods for each Sex, 1923.*

Disease.				5-10.		10-15.		15-20.		20-25.		25-30.		30-35.		35-40.		40-45.		45-50.		50 and over.		All ages.		
				M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Total
Gonorrhœa	...	...	...	1	1	1	39	6	145	16	117	6	82	5	49	5	20	...	27	...	28	...	508	40	548	
Syphilis—																										
Primary	...	...	...	...	...	...	1	...	6	1	9	1	13	3	5	...	2	...	...	...	2	...	38	5	43	
Secondary	...	...	...	...	1	...	...	...	2	2	4	4	...	1	...	...	1	1	1	...	1	...	10	8	18	
Tertiary	...	...	...	...	...	...	...	...	1	...	5	...	1	2	9	...	5	...	2	...	7	3	30	5	35	
Congenital Syphilis	...	...	...	...	...	...	1	...	...	1	1	...	...	...	...	...	...	...	...	1	...	3	1	4		
Chancroid (soft chancre)	...	...	...	...	...	...	...	...	15	...	9	...	10	...	1	...	3	...	2	...	2	...	42	...	42	
Venereal Granuloma	...	...	...	...	...	...	...	...	2	...	...	...	1	1	...	3	...	2	...	...	...	...	1	8	9	
Gonorrhœal Ophthalmia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	
																					632	68	700			

APPENDIX D—continued.

TABLE 3.—Summary of Venereal Disease Notifications received from Metropolitan and other Districts, 1923.

Month.			District.		Syphilis.				Gonor- rhea.	Chancroid.	Granu- loma.	Gonor- rheal Ophthal- mia.	Totals.		
					Primary.	Secondary,	Tertiary.	Congenital					Metro- politan.	Other.	Total.
January	...	...	Metropolitan	...	2	2	1	1	58	2	...	...	66	...	79
	Other	...	2	1	...	...	...	10	...	...	...	...	13		
February	...	...	Metropolitan	...	4	1	1	...	30	7	...	...	43	...	65
	Other	...	2	...	...	...	...	14	4	1	1	...	22		
March	...	...	Metropolitan	...	3	...	1	...	44	10	...	...	58	...	77
	Other	...	4	...	3	...	...	11	1	...	...	...	19		
April	...	...	Metropolitan	...	1	...	4	...	31	7	...	...	43	...	61
	Other	...	2	...	4	1	...	10	...	1	...	...	18		
May	...	...	Metropolitan	...	5	1	3	...	47	4	...	...	60	...	76
	Other	...	1	...	2	...	...	12	1	...	...	...	16		
June	...	...	Metropolitan	...	4	2	...	...	31	1	...	...	38	...	50
	Other	...	1	...	...	...	...	11	...	...	...	...	12		
July	...	...	Metropolitan	...	2	3	1	...	30	3	...	...	39	...	54
	Other	...	...	1	1	...	...	12	...	1	...	...	15		
August	...	...	Metropolitan	...	4	4	2	1	33	...	...	...	44	...	56
	Other	...	...	...	1	...	...	10	...	1	...	...	12		
September	...	...	Metropolitan	...	3	...	3	...	27	1	...	...	34	...	47
	Other	...	1	...	3	...	...	9	...	...	...	...	13		
October	...	...	Metropolitan	...	...	...	2	...	20	...	...	...	22	...	38
	Other	...	...	...	...	...	...	11	1	4	...	...	16		
November	...	...	Metropolitan	...	...	2	3	...	47	...	1	...	53	...	60
	Other	...	...	...	...	...	...	7	...	...	...	...	7		
December	...	...	Metropolitan	...	2	1	...	1	20	...	...	...	24	...	37
	Other	...	...	...	...	...	...	13	...	...	...	...	13		
					43	18	35	4	548	42	9	1	524	176	700

VENEREAL DISEASE.

TABLE 1.—Twelve Months ended 31st December, 1924.
Summary of Notifications.

Disease.						Males.	Females.	Total new cases (both sexes).	Total notifications received.
Syphilis—	Primary	...	...	...	...	18	1	19	22
	Secondary	...	...	...	...	10	3	13	23
	Tertiary	...	...	...	...	38	12	50	60
	Congenital	...	...	...	...	6	...	6	7
Total						72	16	88	112
Gonorrhœa						485	51	536	629
Gleet						...	...	...	2
Chancroid (soft chancre)						14	...	14	15
Granuloma						2	11	13	17
Gonorrhœal Ophthalmia						1	...	1	1
Grand Total						574	78	652	776

APPENDIX E.

BACTERIOLOGICAL AND PATHOLOGICAL
LABORATORY.

Summary of Work, 1923.

Infectious Diseases.	Posi- tive.	Nega- tive.	Incom- plete Posi- tive.	Total.
<i>Diphtheria</i> —				
Throat Swabs	853	5,289	...	6,142
<i>Tuberculosis</i> —				
Sputa	200	834	...	1,034
Urines	...	9	...	9
Pus	...	6	...	6
Cerebro-Spinal fluids	...	3	...	3
Swab Larynx	1	1	...	2
Pleuritic Fluid	...	2	...	2
Guinea-pig Inoculation	...	4	...	4
<i>Typhoid Fever (including the Paratyphoid Fevers)</i> —				
Blood Cultures	10	66	...	76
Urines	5	47	...	52
Faeces	4	132	...	136
Widal Reactions	30	110	...	140
<i>Syphilis</i> —				
Wassermann reactions	233	731	94	1,058
Exudates for Spirochaeta Pallida	1	2	...	3
<i>Gonorrhoea</i> —				
Smears	144	622	...	766
Urines	...	51	...	71
Eye Smears	4	15	...	19
Knee Fluid	1	...	...	1
<i>Malaria</i> —				
Blood Smears	...	2	...	2
<i>Dysentery</i> —				
Faeces for Amoebae	7	20	...	27
Faeces for B. Dysenteriae	1	22	...	23
<i>Bilharziasis</i> —				
Urines	...	8	...	8
Faeces	...	2	...	2
<i>Anchylostomiasis</i> —				
Faeces	...	5	...	5
<i>Ringworm</i> —				
Hair	...	1	...	1
<i>Filariasis</i> —				
Blood	...	1	...	1
<i>Leprosy</i> —				
Tissue	1	1	...	2
Total	...	...	...	9,575

TUMOURS AND TISSUES.

MALIGNANT.

<i>Human</i> —	
Squamous-celled Carcinoma (Epithelioma)	49
Adeno-Carcinoma	19
Scirrhus Carcinoma	3
Carcinoma Simplex	24
Encephaloid Carcinoma	2
Spindled-celled Sarcoma	9
Round-celled Sarcoma	1
Mixed-celled Sarcoma	5
Melanotic Sarcoma	2
Lympho-Sarcoma	1
Rodent Ulcer	13
Endothelioma	6
Chorion-Epithelioma	2
Myeloma	1

TUMOURS AND TISSUES—MALIGNANT.

<i>Human</i> —	
Simple Inflammatory	76
Angioma	3
Fibroma	22
Fibro-Adenoma	25
Adenoma	9
Cyst-Adenoma	6
Simple Cysts	5
Papilloma	11
Polypus (nasal)	2
Normal tissues	18
Fibro-Myoma	5
Necrotic Tissue	4
Cirrhotic	2
Pigmentation	1
Hypernephroma	1
Acute Inflammatory	3
Fatty Degeneration	2
Dermoid Cyst	1
Bowel Dejecta	4
Lipoma	1
Myxoma	1
Myxo-chorndroma	1
Leprosy	2
Tubercular	5
	210
<i>Animal</i> —	
Malignant (Tumour Bullock's Leg) Sarcoma	1
Inflammatory, Pig's Spleen	1
Tubercular, Bullock's Kidney	1
<i>Birds</i> —	
Turkey's head and feet, Multiple Papillomata	1
	4
<i>Vaccines (autogenous)</i> —	
Acne	7
Bacilluria	88
Catarrh of Respiratory Tract	80
Endometritis	3
Pyogenic Infections	79
Pyorrhoea Alveolaris	18
Urethritis	18
	293
<i>Waters</i> —	
Bacteriological Examination	52
Sewage Effluent	1
<i>Milks</i> —	
Bacteriological Examination	7
	60
<i>Chemical and General Examinations</i> —	
Blood :	
Blood Counts	18
Blood Smears for Leukaemia	8
Blood Smears for Pernicious Anaemia	17
Blood for Coagulation Rate	4
Blood for Iso-agglutinins	5
Blood for Sugar Estimation	2
Various :	
Chest Fluids for Cells	5
Synovial Fluids for Cells	1
Faeces for Blood and Protozoa	1
Faeces for Fat	1
Dental Anaesthetic for Toxicity	1
Alkaloid for Toxicity	1
Filter for Efficiency	1
Gum for Disinfectant Value	1
Raisins for Poisons	1
Phenyle for Co-efficiency	1
Fluids for Microscopic	2
	70
Urines :	
Chemical Examinations	15
Microscopical	82
Cerebro-Spinal Fluids :	
Cytological Examinations	20
Globulin Content	14
Sugar Estimation	8
Medico-Legal Examinations	4

APPENDIX E—continued.

TUMOURS AND TISSUES—NON-MALIGNANT.

<i>General Bacteriology—</i>				
Urines for Organisms	...	...	...	161
Pus for Organisms	...	...	...	39
Cerebro-Spinal Fluid for Organisms	...	...	...	19
Pleural Fluid for Organisms	...	...	...	21
Sputa for Organisms	...	...	...	10
Blood for Organisms	...	...	...	19
Throat Swabs for Organisms	...	...	...	4
Nasal Swabs for Organisms	...	...	...	5
Cervical Swabs for Organisms	...	...	...	12
Urethral Swabs for Organisms	...	...	...	4
Sponges and dabs for Organisms	...	...	...	15
Rubber gloves for Organisms	...	...	...	7
Catgut for Organisms	...	...	...	1
Synovial Fluid for Organisms	...	...	...	8
Eye Smears for Organisms	...	...	...	44
Faeces for Organisms	...	...	...	3
Pus for Actinomyces	...	...	...	2
Swabs (Pyorrhoea) for Organisms	...	...	...	2
Urine for Parasites	...	...	...	1
Tongue Scraping for Sprue	...	...	...	1
Culture for B. Welchii	...	...	...	1
Fluid (Axillary)	...	...	...	1
Fluids for Hooklets of Taenia Echinococcus	...	...	...	2
Throat Swabs for Vincent's Angina, 6 positive, 14 negative	...	...	...	20
				402
Grand Total	...	...	...	10,894

SUMMARY OF WORK, 1924.

Infectious Diseases.	Posi- tive.	Nega- tive.	Incom- plete Posi- tive.	Total.
<i>Diphtheria—</i>				
Throat Swabs	232	2,143	...	2,375
<i>Tuberculosis—</i>				
Sputa	185	610	...	795
Urines	...	10	...	10
Pus	...	7	...	7
Cerebro-Spinal Fluids	...	8	...	8
Ulcer of Fauces	...	1	...	1
Pleural Fluids	...	1	...	1
Guinea-pig Inoculations...	4	17	...	21
<i>Cerebro-Spinal Meningitis—</i>				
Cerebro-Spinal Fluids	3	1	...	4
Throat Swabs	1	3	...	4
<i>Typhoid Fever (including Paratyphoid Fevers)—</i>				
Widal Reactions	27	86	10	123
Urines for B. Typhosus	2	35	...	37
Faeces for B. Typhosus	2	36	...	38
Blood Cultures for B. Ty- phosus	...	7	...	7
<i>Syphilis—</i>				
Wassermann Reactions	244	819	96	1,159
Exudates for Spirochaeta Pallida	1	2	...	3
<i>Actinomyces</i>	...	...	...	4
<i>Gonorrhoea—</i>				
Smears	127	662	...	789
Urines	2	72	...	74
Eye Smears	...	17	...	17
<i>Leprosy—</i>				
Smears	2	8	...	10
Tissues	2	2	...	4
<i>Malaria—</i>				
Blood Smears	1	12	...	13
<i>Dysentery—</i>				
Faeces for Amoebae	4	23	...	27
Faeces for B. Dysenteriae	...	23	...	33
Bilharziasis	...	2	...	2
<i>Anchylostomiasis—</i>				
Faeces	...	1	...	1
Total	...	...	...	5,467

TUMOURS AND TISSUES.

<i>HUMAN.</i>				
<i>Malignant—</i>				
Squamous-celled Carcinoma (Epithelioma)	...	...	...	27
Adeno-Carcinoma (Malignant Adenoma)	...	...	...	8
Scirrhus Carcinoma	...	...	...	1
Carcinoma Simplex	...	...	...	15
Rodent Ulcer	...	...	...	8
Spindled-celled Sarcoma	...	...	...	2
Endothelioma	...	...	...	2
Round-celled Sarcoma	...	...	...	3
Mixed-celled Sarcoma	...	...	...	1
Giant-celled Sarcoma	...	...	...	1
Duct Carcinoma	...	...	...	2
Hypernephroma	...	...	...	1
Encephaloid Carcinoma	...	...	...	1
				72
<i>Non-Malignant—</i>				
Simple Inflammatory	...	...	...	29
Fibroma	...	...	...	7
Fibro-Adenoma	...	...	...	16
Cyst-Adenoma	...	...	...	7
Adenoma	...	...	...	8
Fibrosis	...	...	...	10
Normal Tissues	...	...	...	22
Fatty Degeneration	...	...	...	4
Decidual Tissue	...	...	...	1
Polypus	...	...	...	2
Haematoma	...	...	...	2
Naevus	...	...	...	1
Lipoma	...	...	...	3
Osteochondroma	...	...	...	1
Cirrhotic	...	...	...	1
Bowel Dejecta	...	...	...	3
Sebaceous Cysts	...	...	...	2
Cysts	...	...	...	4
Granulation Tissue	...	...	...	2
Septicaemia	...	...	...	1
Necrosis	...	...	...	1
Warts	...	...	...	1
Atheroma	...	...	...	1
Tubercular Tissues	...	...	...	7
Syphilitic Tissues	...	...	...	1
				137

ANIMAL.

Bullock's Kidney, Tuberculosis	...	...	...	1
Bullock's Liver, Fibrous	...	...	...	1
Bullock's Liver, Cystic	...	...	...	1
Sheep's Liver, Fatty Degeneration	...	...	...	1
Horse, Papilloma	...	...	...	1
				5
<i>General Bacteriology—</i>				
Pus	...	...	...	34
Cerebro-Spinal Fluid	...	...	...	26
Pleural Fluid	...	...	...	7
Sputa	...	...	...	9
Blood Cultures	...	...	...	15
Throat Swabs (other than Diphtheria Swabs)	...	...	...	12
Cervical Swabs	...	...	...	5
Eye Smears	...	...	...	7
Urines	...	...	...	213
Faeces	...	...	...	15
Sponges	...	...	...	4
Fluid from Vesicles	...	...	...	1
Abdominal Fluid	...	...	...	1
Vincent's Angina (Swabs)	...	...	...	8
Sheep's Bile	...	...	...	1
Preserved Fish	...	...	...	1
Jam	...	...	...	1
Mouth Ulcer	...	...	...	1
Thrombus in Vein	...	...	...	1
Blood Urine, etc., for Hog Cholera	...	...	...	1
Specimens for Actinomyces	...	...	...	4
				367

APPENDIX E—continued.

<i>Vaccines (autogenous) Prepared—</i>							<i>Chemical and General—continued.</i>						
Acne	...	...	...	...	...	6	Urine for Lead	...	...	...	...	1	
Bacilluria	...	...	...	...	...	55	Urine for quantitative urea	...	...	...	...	6	
Catarrh of Respiratory Tract	...	...	...	...	...	74	Urine for quantitative Glucose	...	...	...	...	5	
Endometritis	...	...	...	...	...	4	Urine for quantitative Fermentation uest	...	...	...	...	2	
Progenic Infections	...	...	...	...	...	72	Gastric Contents	...	...	...	...	1	
Pyorrhoea Alveolaris	...	...	...	...	...	11	Skin for Parasites	...	...	...	...	1	
Urethritis	...	...	...	...	...	7	Urines for Chemical Examination	...	...	...	...	16	
Tonsil Infections	...	...	...	...	...	4	Urines for Microscopic Examination	...	...	...	...	74	
Bloods	...	...	...	...	...	2	Bleaching Powder for percentage of Chlorine	...	...	...	...	1	
						235	Bowel ejecta	...	...	...	...	2	
													224
<i>Chemical and General—</i>													
Blood Counts	...	...	...	...	...	32	Medico-Legal	...	...	...	...	2	
Blood Smears for Leukaemia	...	...	...	...	...	7	Waters	...	...	...	...	103	
Blood for Pernicious Anaemia	...	...	...	...	...	7	Cream	...	...	...	...	1	
Blood for Isoagglutination	...	...	...	...	...	1	Milk	...	...	...	...	10	
Blood for Coagulation Rate	...	...	...	...	...	1	Sewage Effluents	...	...	...	...	34	
Bloods for Sugar Estimation	...	...	...	...	...	32	Disinfectants	...	...	...	...	2	
Faeces for Intestinal Parasites	...	...	...	...	...	1							
Smear for Spermatozoa	...	...	...	...	...	1							
Sheep's Stomach for Parasites...	...	...	...	...	...	1							
Cerebro-Spinal Fluid for Cells	...	...	...	...	...	29							
Cerebro-Spinal Fluid for Globulin Content	...	...	...	...	...	3	Grand Total	...	...	...	...	6,659	

The lamblia infection occurred in a child who was in hospital for a gastro-intestinal derangement with cerebral irritation—the symptoms probably being due to the lamblia infection.

Of the other cases of liver abscess which I was unable to trace, the history of one was given me by Dr. Mathews. This was a man—M—(an Australian) who had lived in a camp at Kurrawang in close proximity to the patient L, who was found to be harbouring histolytica cysts in large numbers. This man was operated on by Dr. Mathews on two separate occasions for liver abscess, and he is now living at Mount Sir Samuel. Dr. Mathews reported that when available, emetine had been given to all the cases of liver abscess, but the course given to each patient had varied with the supply of the drug at his disposal. Most of the cases had shown marked improvement under emetine treatment. In addition to cases of hepatic abscess, Dr. Mathews informs me that hepatitis is very commonly met with. I have advised him to use emetine in future on all cases of hepatitis admitted to hospital.

This survey, brief though it is, has been productive of information of great importance. It has established beyond doubt that the cases of liver abscess which are occurring with increasing frequency on the W.A. Goldfields are due to *A. histolytica*. Of the total number of patients examined (38), four were found to be harbouring cysts of *A. histolytica*, and of these, three had never been out of Australia and must therefore have become infected locally. A further case (M), in which no examination could be made, had been twice operated on for liver abscess, and the history is sufficient to indicate that he was also infected locally.

With regard to the origin of the infection which must now be regarded as being endemic on the Eastern Goldfields, I do not think this can be attributed to the re-

turn of soldiers from the recent war. There is a large population of foreigners in the area, mostly from countries along the Mediterranean littoral where amoebic dysentery had been endemic since the days of the Athenian pestilence during the Peloponnesian War.

Dr. Seed, who for many years was Government Medical Officer at Coolgardie, informs me that he saw many cases of genuine dysentery and operated on fifteen or twenty cases of liver abscess in the days when Coolgardie was a thriving goldfield. One of the patients whom I examined and who was carrying large numbers of histolytica cysts gave a history of a severe attack of dysentery fifteen years ago at Leonora. This patient was operated on for liver abscess last October. There can be little doubt that amoebic dysentery had been endemic on the Eastern Goldfields district for many years, though it is possible that the increasing incidence of liver abscess is in part due to increased foci of infection in the return of soldiers, some of whom are probably cyst carriers.

The climatic conditions in this district are such as would favour the spread of infection, i.e., a dry hot climate with much dust and abundance of flies. Moreover, there is no water carriage system for sewage disposal, the pan system being practically in universal use.

The absence of any laboratory facilities for the diagnosis and detection of dysentery infections probably plays a considerable part in the prevalence of the condition. I would suggest that a copy of this report be sent to the Commonwealth Health Department, which, I understand, is contemplating opening a laboratory at Kalgoorlie.

CYRIL H. SHEARMAN,
Bacteriologist.

5th February, 1923.

APPENDIX G.

MEDICAL INSPECTION OF SCHOOLS, 1923-1924.

The Commissioner of Public Health.

Dear Sir,

I have the honour to submit the following report of the work done in the schools of the Metropolitan and Goldfields areas during the years 1923 and 1924.

I resumed duty on the 1st February after a prolonged absence in Europe. It was necessary to at once train two nurses and later in the year a third, as the nurses previously engaged in school work had left the Department.

It had been hoped that it would be possible to visit all large schools in the metropolitan area at least once each year under the system of inspecting the children of between seven and eight years of age and twelve and thirteen years of age. This hope, however, has not been fulfilled.

There are over one hundred primary schools in and around the metropolitan area, as well as a number of primary convent schools. The children of routine ages number about 9,000, so that it is obviously impossible for one medical officer, even with the occasional assistance which is given by other officers of the Health Department, to examine so many.

The method employed during a school examination is to give inspection cards to all the children of routine ages, to such special cases as are considered by the teachers to need medical examination and to any whose parents ask for an examination. While in the school the medical officer also picks out such children as present any obvious defect or which medical advice is needed.

The report of each school, therefore, includes "routines," "specials with cards," and "specials without cards," also "recalls." The recalls are children who have been previously inspected and recommended for medical treatment: they are called up in order to discover whether the parents have acted upon the advice given.

In 1923, 69 schools were inspected and 5,892 children examined. Of these, 4,948 were "routines" or "specials with cards"; 944 were "specials without cards,"

During the year a visit of six weeks was paid to the Kalgoorlie-Boulder District, the schools of which had not been inspected for ten years. There was no doubt that the children were in need of such an inspection. The results (see appendix) plainly show how necessary it is that at least one medical officer should be appointed to carry out this work in the schools outside the metropolitan area.

The outstanding feature of the year was a campaign against pediculosis. All of the children in the Goldfields schools were examined. The number of children whose heads were examined in the metropolitan area was 20,421; of these 5,863 were found to be more or less infested. This makes a percentage of 28.7. The number heavily infested was considerable. To the parents and guardians of such children 631 registered letters were sent out. Sixteen of these were sent in the Kalgoorlie-Boulder district. These figures do not represent the whole number of children, as in many cases two or more in the same family were named in one letter. Only 34 parents were prosecuted; the others cleansed their children's heads. The large majority were only lightly infested. Publicity was given in the Press to the proceedings in court and the names of those prosecuted were published. There is no doubt that the effect of this is salutary in the districts where prosecutions take place. Careless and neglectful parents are aroused to a sense of the need of dealing adequately with this disgusting and preventible defect.

Four hundred visits were paid by the nurses to the homes of the children.

A number of the parents were also interviewed at schools by the medical officer, and in practically every case the advice given was acted upon.

In previous years invitations were extended at each school to the parents to attend a short "talk" by the Medical Officer of Schools. The attendance proved disappointing. Most of the mothers who came were those who already cared for their children, while the careless and neglectful ones were conspicuous by their absence. It was, therefore, decided to introduce instead short addresses to the children. In these special

stress is laid upon the need for care of the teeth, care of the head, general personal cleanliness, and care of the closets, more especially in those schools where the pan system is in use.

As regards the result of the work, it is impossible to speak accurately. The number of recalls examined in 1923 was 649. It was found that 322 needed to be re-notified; though some of them had had partial treatment. The figure seems large, but it must be realised that many of the cases ought to have had dental treatment but did not receive it and, therefore needed a further notification. Ninety-two had received treatment, were being treated, or had arranged for treatment. Sixty-nine needed no re-notification. The remainder were cases which had not been notified for a defect but were re-examined to make sure that no defect had emerged since the previous examination. It is evident that parents are increasingly willing to act upon the advice given.

During October a Conference of Medical Officers of Schools was held in Melbourne. Western Australia was, unhappily, the only State not represented. The following resolution, however, was sent forward from this State:—"That the Federal and State Governments be asked to formulate and subsidise on a population basis a scheme for effectively dealing with mental defectives of all ages." The motion was passed unanimously.

During 1924, 61 schools were inspected and 6,098 children examined. Seven of these schools (698 children) were inspected by Drs. Dale, Hone and Joyce, the other 5,400 were inspected by me.

An analysis of the records shows that of these 6,098, 3,581 were of routine ages, i.e., between seven and eight or between 12 and 13. 1,173 were "specials" with cards, 448 were "specials" without cards. There were 897 "recalls." It was found that of these 124 had received attention, 424 needed re-notification, most of them as in the previous year for decayed teeth. Quite a number had had home treatment for such defects as pediculosis and seborrhoea; in some cases new defects had arisen which called for notification. The remainder needed no notification, chiefly because their decayed teeth had disappeared.

It is gratifying to find that, as a result of the continual and systematic examination of the children's heads, which was made possible by the appointment of three nurses to the school staff, the percentage of pediculosis shows a decided diminution.

In 1923, 20,441 heads were inspected, and of these 5,863, or 28.7 per cent. showed evidence of pediculosis; whereas during 1924 20,538 heads were inspected, and of these 4,136, or 20.13 per cent., were affected. This represents a fall of nearly 9 per cent. 575 registered letters were sent out, the large majority brought about the desired result. In seventeen cases prosecutions were necessary and a fine of £2 was imposed. The co-operation of the teachers in dealing with this defect is of the utmost importance and, in a number of instances, is heartily given. A greater improvement in the condition of the heads is looked forward to with confidence.

The nutrition records are now available of 5,437 children. Of these 2,660 were N3 or of average nutrition; 456 were over the average; 1,321 were under. Of these 848 were boys.

It must be admitted that these figures show an unsatisfactory state of affairs in our midst. Rather over 24 per cent. of the children in our primary schools are under-nourished. The factors which cause this are, no doubt, numerous and complicated, bound up with social and economic questions of many kinds. Some of them we know and ought to be able to combat, and so far as lies within our power we ought to attack them wholeheartedly by means of a campaign to educate parents in methods of dealing with them.

There is still much ignorance as to the best kinds of food to eat. The large majority of us still use white bread, although its nutritive value falls much below that of whole-meal bread. Milk, fruit and vegetables are all much more expensive than they should be. The use of cooked meats and tinned foods, bought by careless housewives, is much too common. In many house-

holds the usual breakfast consists of bread and butter and tea; the children's lunches of sandwiches made of white bread, sometimes with the addition of a little meat or tomato, jam or cheese, sometimes not; these are washed down by a drink of water. Many children who are given pennies to buy lunch spend them on pastry or sweets, so that quite a number receive only one adequate meal a day—dinner in the evening.

Again, the need of physical rest and long hours in bed is very insufficiently recognised. Inquiries have made plain the fact that numbers of children of nine years old (or even younger) have only seven or eight hours in bed, whereas ten should be the minimum.

Valuable work in support of this contention has been carried out in special camp schools in America, where it was found that the improvement in weight of children, who were made to rest for a period each day, and go to bed early, was out of all proportion to the amount which could be considered due to the increased food values given.

Apart from the question of physical growth, there is no doubt that the nervous systems of children are profoundly and adversely influenced during the unstable period of growth and development, by want of sleep and quiet.

Closely allied to the problem of mal-nutrition is that of dental caries. We are still sadly deficient in adequate facilities for the prevention of and treatment for this universal defect; we anxiously await the appointment of, at least, one full time dentist for work among school children.

In September a most interesting and instructive visit was paid to the dental clinic for school children in St. Kilda Road, Melbourne. There, two full-time dentists are constantly at work, with very beneficial results, on a large number of children. Their efforts are directed to prevention rather than cure. Necessary extractions are, of course, undertaken, but the main work is the preservation of the permanent teeth by attention to the temporary teeth, and more especially to the first permanent teeth (the six-year-old molars). The children attending the clinic are shown by the nurses in charge how to clean their teeth properly, and these also remove green stain and tartar from the mouths of such cases as require this done. Our need for a similar clinic is urgent.

Happily, however, we can claim a decided improvement on the dental conditions which existed eight years ago. A far larger number of children clean their teeth and do it efficiently; many more have their teeth filled or extracted. Parents, children and teachers are all much more alive to the need for oral hygiene and its importance for good general health. Another factor in under-nutrition and one found in the case of a considerable proportion of the older boys, is employment out of school hours. This is extremely difficult to counter, chiefly because it is hard to prove. Often it is denied or minimised, because such employment adds a little to the often too slender income of the family concerned. There is a great temptation to sacrifice the future to the present. If a boy can earn a few shillings and so contribute towards his own support, it is natural for hard-pressed parents to allow, or even urge him to do so. The only adequate way to meet this is the establishment of some form of monetary help which should be given to the parent or guardian of each child under 14 years of age.

A wide-spread epidemic of measles was responsible for a number of cases of mild conjunctivitis. Parents need to be told of the necessity for bathing the eyes, in these cases, with a mild antiseptic lotion to prevent the condition becoming chronic.

The need of some more adequate method of securing treatment of the defects notified for medical attention continues. There are always a few cases, where in spite of repeated advice given and persuasion used by the staff, parents refuse to have serious defects of sight or hearing treated. For these a compulsory clause, similar to that dealing with verminous children, is desired.

From the beginning of February to the 31st December, 1924, 326 visits were paid by the school nurses.

Among the children who had been notified for medical or dental treatment the nurses found that seventy-seven had had, or were receiving treatment. In 121 cases the parents had not yet had the children treated, but promised to do so. In seven cases the parents declined to follow the advice given.

In connection with this subject of treatment, it may be mentioned that the Chief Resident Medical Officer of the Children's Hospital states that a very large number of school children attend there and present the school medical inspection notification forms.

When paying visits, the nurses found that the majority of the parents welcomed them and were glad to discuss their children's health with them, although they were not always prepared to act on the advice given.

Towards the end of the year one of the nurses on the staff resigned her position. A temporary nurse was appointed but left after a few weeks to fill another engagement and the position was left vacant until the beginning of 1925.

In conclusion, it may be fairly be claimed that there are evidences of a distinct advance in attention to personal hygiene on the part of teachers, parents, and children.

I desire to acknowledge the continually increasing co-operation given to the work by the teachers, without which much of it would be valueless. For this help I am very grateful. The excellent work done by the school nurses and the loyal support they have given me throughout the year also deserves recognition.

There remain still numerous ways in which improvement can be made. Of these, the four which specially call for mention are:—

- (1) The appointment of a larger medical staff.

It is impossible for the whole of the schools in the metropolitan area alone to be visited even once a year, while many country schools have never been inspected at all.

We are behind every State except Queensland and South Australia in this matter, and both those States are now setting out to build up a comprehensive system.

In South Australia Dr. Gertrude Halley will shortly have under her direction one man and four women doctors, and four more school nurses than are at present on her staff. In that State special efforts are to be made to deal with the problem of mentally defective children, a problem to which attention has frequently been directed here, so far with but little result.

- (2) A full-time dental clinic for all kinds of oral hygiene.

- (3) A general medical clinic.

The Children's Hospital is already overburdened in its out-patients' departments. A school clinic would help to relieve this and would also be of great use to the school medical officers by enabling them to follow up cases which they see in school.

- (4) The establishment of a centre to which children suffering from posture defects could go for remedial exercises and the re-education of their muscular systems.

Whilst, in the present state of the finances, it is realised that we cannot have all of these desirable additions to our organisation, it is well to put the need for them on record that they may not be lost sight of.

ROBERTA H. M. JULL,
Medical Officer of Schools.

2nd February, 1925.

APPENDIX G.—continued.
List of Schools examined during 1923.

METROPOLITAN.

Name of School.	Date Examined.	Number Examined.	Number Defective.	Number referred for Medical Attention.	Number referred for Dental Attention.	Number referred for Home Attention.	Number Pediculosis.	Percentage Pediculosis.	Nutrition Standard.		
									Normal.	Sub-normal.	Above Normal.
Richmond ...	6-7/2/23	54	46	12	34	24	3	5.3	...	...	...
Beaconsfield Infants ...	13-15/2/23	41	39	11	32	21	7	17.0	...	...	...
Beaconsfield Senior ...	8-9-12/2/23	33	32	5	27	24	14	42.4	...	...	...
North Fremantle ...	28/2/23	58	52	11	31	21	...	...	...	...	...
...	1/3/23	44	40	7	23	21	17	38.6	...	...	...
...	...	44	37	6	28	25	6	13.6	...	...	...
East Fremantle Infants ...	21-22/2/23	39	37	3	22	28	18	46.0	...	...	...
...	...	58	53	13	41	27	6	10.3	...	...	...
North Fremantle Infants ...	2/3/23	47	35	6	32	25	12	25.5	...	...	...
...	...	19	17	5	13	10	5	26.3	...	...	...
North Cottesloe ...	14-15/3/23	20	12	3	9	9	8	40.0	...	...	...
...	...	14	9	1	6	4	1	7.1	...	...	...
Swanbourne ...	16-19/3/23	10	6	1	4	3	2	20.0	...	...	...
...	...	35	21	5	13	14	2	5.7	...	...	...
Graylands ...	20/3/23	33	25	7	12	19	13	39.09	...	...	...
...	...	7	7	3	6	4	1	14.3	...	...	...
Buckland Hill ...	7/3/23	7	7	1	6	3	3	42.8	...	...	...
Claremont Practising ...	2/3/23	48	42	9	36	31	7	14.5	...	...	...
...	...	33	30	7	21	24	17	51.5	...	...	...
Cottesloe Senior ...	13/3/23	23	19	3	12	10	1	4.3	...	...	...
...	...	20	12	3	3	9	7	35.0	...	...	...
Cottesloe Infants ...	12/3/23	51	40	9	23	28	2	39.2	...	...	...
...	...	50	47	16	19	39	24	48.1	...	...	...
East Fremantle Seniors ...	...	20	18	2	16	15	1	5.0	...	...	...
...	...	25	24	3	17	17	8	32.0	...	...	...
White Gum Valley ...	6/3/23	30	25	6	14	14	4	13.3	...	...	...
...	...	34	31	15	19	23	20	58.8	...	...	...
Claremont Senior ...	10/4/23	14	11	3	8	4	1	7.1	...	...	...
...	...	16	16	3	8	13	10	62.5	...	...	...
...	...	34 } + 5	15	5	11	12	3	8.8	...	...	...
Nedlands ...	17-19/4/23	...	16	7	8	14	11	44.0	...	...	...
...	...	46	29	6	6	24	2	4.35	27	4	1
Claremont Infants ...	11-12/4/23	51	31	3	7	28	8	15.6	27	2	7
...	...	22	12	4	3	11	2	9.09	...	...	...
Subiaco Senior ...	23-30/4/23	13	9	2	5	8	3	23.07	...	...	...
...	...	87	58	9	34	47	2	2.29	50	10	11
Jolimont ...	16/4/23	98	70	14	34	62	25	25.51	53	15	15
...	...	22	13	1	4	11	4	9.09	9	3	1
Subiaco Intermediate ...	30/4/23	22	15	5	6	14	14	63.63	7	4	4
...	...	2	2	1	1	2	...	...	2	...	...
Subiaco Infants ...	1-4/5/23	3	3	...	...	3	2	66.6	1	2	...
...	...	71	51	11	16	46	5	7.04	31	18	7
Rosalie School ...	8-9/5/23	54	39	3	14	35	15	27.77	26	12	6
...	...	45	23	7	4	16	3	6.6	17	10	3
Mt. Hawthorn ...	14/5/23	30	22	...	5	20	7	23.3	17	1	4
...	...	46	38	6	16	36	2	4.35	24	11	1
Osborne Park ...	11/5/23	44	33	6	10	32	13	29.54	25	4	3
...	...	16	10	4	...	10	...	...	5	6	...
Leederville ...	18-28/5/23	17	14	...	4	9	8	47.0	8	4	4
...	...	53	43	7	11	39	11	20.75	38	3	8
Bibra Lake ...	29/5/23	61	49	9	17	40	19	31.14	44	7	6
...	...	4	2	...	1	1	1	25.0	2	...	2
Hamilton Hill ...	29/5/23	10	7	1	3	7	4	40.0	6	1	...
...	...	14	13	1	7	11	3	21.43	10	3	...
Spearwood ...	29/5/23	8	8	...	7	8	7	87.5	4	2	2
...	...	14	10	3	2	8	5	35.71	5	4	4
Jandakot ...	29/5/23	7	6	...	2	6	4	57.14	3	3	1
...	...	3	1	...	...	1	...	...	...	...	...
Newcastle Street ...	23-28/5/23	5	2	...	1	2	2	40.0	...	...	...
...	...	45	37	8	8	35	6	13.3	28	10	1
Njooknbooroo ...	15/6/23	59	54	13	15	49	18	30.51	38	6	12
...	...	12	12	4	3	9	...	...	16	2	3
Lake Guelup ...	15/6/23	9	9	3	4	9	1	11.1	...	...	...
...	...	18	16	5	5	12	2	11.1	...	...	...
Thomas Street Senior ...	30/5/23	16	14	3	2	14	3	18.7	...	...	...
...	...	43	32	9	16	18	4	9.32	21	14	4
Grenville ...	1/6/23	43	31	6	14	25	12	27.9	21	10	6
...	15/6/23	13	9	...	6	7	2	15.4	6	4	1
West Leederville ...	13-18/6/23	19	14	1	4	10	3	15.7	9	5	3
...	...	85	69	19	25	54	5	5.0	...	...	...
Thomas Street Infants ...	7-11/6/23	81	65	18	28	51	16	19.8	...	...	...
...	...	51	35	6	2	34	...	...	27	10	1
North Perth Senior ...	19-21/6/23	34	26	3	2	26	6	17.64	17	3	8
...	...	56	36	18	18	28	2	3.6	31	9	...
North Perth Infants ...	27-29/6/23	58	44	10	21	36	15	25.8	35	15	1
...	...	56	48	5	4	48	4	7.1	44	7	5
Highgate Infants ...	2-3/7/23	45	42	4	4	42	19	42.2	28	7	10
...	...	72	52	7	5	51	4	19.4	43	13	3
Midland Junction Senior ...	4-5/9/23	60	47	6	1	44	29	46.3	35	10	8
...	...	29	25	8	12	21	4	14.3	15	11	1
Bellevue ...	7/9/23	29	28	3	14	26	10	34.5	21	8	...
...	...	14	13	1	5	12	...	...	6	5	2
Guildford ...	12-13/9/23	15	12	3	3	11	5	33.3	10	4	1
...	...	27	20	3	8	19	1	3.7	15	11	1
Midland Junction Infants ...	6-11/9/23	30	26	6	7	23	7	23.3	23	4	3
...	...	41	38	7	8	37	5	12.2	27	13	1
Bassendean ...	17-18/9/23	25	22	3	2	20	10	40.0	20	3	1
...	...	37	36	10	13	28	1	2.7	28	8	1
Eden Hill ...	20/9/23	34	32	8	8	30	17	50.0	27	4	3
...	...	6	6	2	...	6	...	...	4	2	...
Bayswater ...	24-25/9/23	11	8	3	...	8	3	27.2	7	...	3
...	...	36	31	11	9	28	9	25.0	18	13	4
Maylands Infants ...	27-28/9/23	43	42	12	8	41	19	44.19	24	7	10
...	...	49	40	8	2	40	7	14.2	29	15	5
Maylands Senior ...	2-5/10/23	36	29	7	2	29	9	25.0	21	1	10
...	...	60	49	9	16	43	3	50.0	37	17	5
Mt. Lawley ...	8-12/10/23	54	42	7	13	36	17	31.5	35	12	7
...	...	70	55	12	12	50	...	...	35	29	6
Inglewood ...	16-19/10/23	50	38	7	11	34	11	22.0	30	9	10
...	...	43	32	8	11	30	2	4.6	29	11	3
East Perth Infants ...	25-26/10/23	25	20	4	7	17	7	28.0	20	1	4
...	...	36	31	8	3	30	4	11.11	29	6	1
East Perth Senior ...	12-13/11/23	43	39	5	9	37	7	16.3	34	6	3
...	...	29	23	6	11	15	...	...	21	6	2
Highgate Senior ...	14-20/11/23	56	38	5	18	32	13	23.21	41	8	7
...	...	109	70	16	31	58	18	16.5	68	32	8
Victoria Park ...	22-29/11/23	71	53	11	27	47	27	38.03	49	13	6
...	...	69	63	13	24	57	3	4.3	50	19	...
East Victoria Park ...	30/11/23	80	71	11	27	61	21	26.25	56	12	9
...	3-5/12/23	63	52	14	14	48	2	3.2	31	26	6
Carlisle ...	11-14/12/23	59	49	8	13	44	13	22.03	36	13	10
...	...	45	38	7	11	30	...	...	27	17	...
...	...	46	41	4	9	37	11	23.90	30	9	5
...	...	4,204	3,338	692	1,329	2,759	820	...	1,793	609	294

"Specials" are included in "No. examined" and "pediculosis" figures only.
M—Males, F—Females.

APPENDIX G—continued.

List of Country Schools Examined during year ended 31st December, 1923—continued.

Name of School.					Date Examined	Number Examined.	Number Defective.	Number referred for Medical Attention.	Number referred for Dental Attention.	Number referred for Home Attention.	Number Pediculis.	Percentage Pediculis. %	Number not notified.
East Brookton M.					6/2/23	4	1	1	nil	nil	nil	...	3
... .. F.					...	5	nil	nil	nil	nil	...	...	5
Boyagarra M.					6/2/23	7	7	2	7	nil	nil	...	nil
... .. F.					...	5	2	nil	2	1	nil	...	3
Brookton M.					15-19/3/23	8	8	nil	8	1	nil	...	nil
... .. F.					...	16	14	5	13	3	1	6.2	2
Youraling M.					7/3/23	5	3	1	3	nil	nil	...	2
... .. F.					...	5	4	nil	4	1	nil	...	1
Wedgecarrup M.					18/4/23	10	6	6	nil	nil	nil	...	4
... .. F.					...	14	6	6	nil	nil	nil	...	8
Cue M.					29/5/23	40	12	3	10	nil	nil	...	28
... .. F.					...	48	17	3	15	nil	nil	...	31
Day Dawn M.					19/6/23	19	4	3	1	nil	nil	...	15
... .. F.					...	16	4	3	1	nil	nil	...	12
Coganollop M.					19/6/23	2	1	nil	nil	1	nil	...	1
... .. F.					...	6	6	1	5	1	1	16.6	nil
Mobrup M.					29/6/23	6	4	2	4	1	nil	...	2
... .. F.					...	6	4	1	4	1	nil	...	2
Kulikup M.					26/6/23	12	8	3	6	1	nil	...	4
... .. F.					...	8	7	4	3	4	3	37.5	1
Maradupp M.					25/6/23	12	11	3	7	2	nil	...	1
... .. F.					...	6	5	2	4	3	1	16.6	1
Qualeup M.					27/6/23	3	2	1	1	nil	nil	...	1
... .. F.					...	6	5	nil	5	1	1	16.6	1
Jingalup M.					2/7/23	4	4	nil	4	nil	...	...	nil
... .. F.					...	8	4	2	3	nil	...	...	4
Boscabel M.					9/7/23	6	6	2	6	1	nil	...	nil
... .. F.					...	1	1	nil	1	nil	nil	...	nil
Marleyup M.					3/7/23	7	5	3	5	nil	nil	...	2
... .. F.					...	13	11	4	11	nil	nil	...	2
Kojonup M.					17-30/7/23	46	44	15	41	13	nil	...	2
... .. F.					...	36	31	4	26	17	5	13.9	5
Ashfield M.					23/7/23	5	5	nil	5	1	nil	...	nil
... .. F.					...	4	2	nil	2	nil	nil	...	2
North Dandalup M.					16/8/23	15	4	2	1	2	1	6.6	11
... .. F.					...	19	7	3	1	6	6	31.6	12
Northampton M.					6/9/23	28	2	nil	4	nil	nil	...	26
... .. F.					...	39	12	5	3	6	nil	...	27
Boilup M.					14/9/23	6	5	3	4	2	nil	...	1
... .. F.					...	6	3	1	nil	3	nil	...	3
Tammuin M.					1/10/23	47	36	5	27	6	nil	...	11
... .. F.					...	43	35	8	18	nil	nil	...	8
Yalgoo M.					4/10/23	15	11	1	8	2	2	13.3	4
... .. F.					...	13	3	nil	2	3	3	23.0	10
Cherry Tree Pool M.					11/10/23	9	9	6	4	5	3	33.3	nil
... .. F.					...	3	2	1	2	nil	nil	...	1
Babakine M.					11/10/23	4	4	1	4	nil	nil	...	nil
... .. F.					...	9	7	5	7	nil	nil	...	2
Kellerberrin M.					16/10/23	25	20	5	4	2	1	4.0	5
... .. F.					...	12	7	3	3	nil	nil	...	5
Doodlakine M.					1/11/23	24	10	3	7	3	nil	...	14
... .. F.					...	27	14	6	12	1	nil	...	13
Kulyalling M.					13/11/23	4	4	1	3	nil	nil	...	nil
... .. F.					...	7	6	nil	6	1	nil	...	1
South Dale M.					16/11/23	6	6	2	5	nil	nil	...	nil
... .. F.					...	4	3	nil	3	nil	nil	...	1
Kweda M.					11/12/23	9	7	nil	7	1	nil	...	2
... .. F.					...	nil	nil	nil	...	...	...	...	...
Dumbleyung M.					11-20/12/23	41	32	20	16	7	2	4.8	9
... .. F.					...	37	33	16	20	10	10	27.0	4
Goomalling M.					12/9/23, and 18/12/23	46	43	15	37	28	17	36.9	3
... .. F.					...	47	43	6	38	31	28	59.5	4
Total					...	944	622	198	453	172	85	...	322

List of Schools Examined in Kalgoorlie and Boulder Districts during year 1923.

Name of School.				Date Examined.	Number Examined.	Number Defective.	Number referred for Medical Attention.	Number referred for Dental Attention.	Number referred for Home Attention.	Number Pediculis.	Percentage Pediculis. %	Nutrition Standard		
												Normal	Sub-normal.	Above Normal
South Boulder ...	...	M.	7/5/23	32	29	9	13	27	8	25.0	24	5	1	
		F.	...	25	24	6	8	24	14	56.0	16	6	3	
Kalgoorlie Senior ...	...	M.	11-13/7/23	64	63	15	44	50	5	7.8	31	29	4	
		F.	...	43	40	4	26	37	19	44.2	33	3	7	
South Kalgoorlie ...	...	M.	18-19/7/23	33	30	11	9	26	1	3.03	16	16	1	
		F.	...	36	35	5	15	33	8	22.2	27	3	6	
Boulder Seuior ...	...	M.	23-25/7/23	55	49	12	32	38	1	1.8	2	17	2	
		F.	...	55	46	12	29	37	15	27.2	34	14	7	
Boulder Intermediates ...	...	M.	26/7/23	16	16	3	13	15	3	18.8	5	9	2	
		F.	...	20	20	3	14	17	10	47.6	15	3	3	
Boulder Infants ...	...	M.	27-30/7/23	74	65	16	6	62	12	16.2	45	27	2	
		F.	2-3-6/8/23	66	60	19	10	56	19	28.8	46	9	11	
Boulder ...	...	M.	9/8/23	13	12	1	6	11	1	7.7	8	5	nil	
		F.	...	23	23	2	5	21	10	43.5	14	4	5	
Brown Hill ...	...	M.	10/8/23	9	7	2	3	7	3	33.3	4	5	nil	
		F.	...	10	9	1	5	8	4	40.0	2	5	3	
Trafalgar ...	...	M.	10/8/23	17	17	8	9	15	3	17.6	6	9	2	
		F.	...	14	13	2	5	12	5	35.7	11	2	1	
North Kalgoorlle ...	...	M.	15/8/23	45	38	7	11	32	4	8.8	33	10	3	
		F.	...	53	46	6	14	43	21	39.6	38	10	3	
Kalgoorlie Infants ...	...	M.	16-17/7/23	30	28	7	4	27	4	13.3	21	7	2	
		F.	...	39	39	5	8	36	12	30.7	29	5	5	
East Kalgoorlie ...	...	M.	13/8/23	9	6	1	2	6	nil	...	8	1	nil	
		F.	...	11	9	1	2	9	5	45.4	7	4	nil	
Somerville ...	...	M.	14/8/23	10	10	3	nil	9	2	20.0	3	4	2	
		F.	...	11	11	3	1	11	5	45.1	9	1	1	
Total	...	...	...	813	745	164	294	669	194	...	487	213	76	

M—Males.

F—Females.

APPENDIX G—continued.
List of Schools Examined during 1924—continued.
METROPOLITAN.

Name of School.	Date Examined.	ROUTINES.										SPEC. IALS.				RE-CALLS.		Nutrition Standard.							
		Number Examined.		Number Notified.		Number referred for Medical Attention.		Number referred for Dental Attention.		Number referred for Home Attention.		Number referred for Pediculosis.		Percentage Pediculosis.				Normal.		Sub-normal.		Above normal.			
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
Perth Infants	15-21/2/24	52	35	42	31	9	4	4	3	39	29	1	10	1.9	28.5	14	19	12	13	45	29	19	9	1	16
Perth Boys	19-27/2/24	130	...	109	...	17	...	54	...	101	...	8	...	6.0	...	2	...	9	...	45	...	65	...	18	...
Perth Intermediate	11-12/2/24	36	42	28	38	4	4	13	20	22	28	2	11	5.4	26.2	9	32	...	...	32	51	12	14	1	9
Fremantle Infants	5-6/3/24	24	16	22	16	4	1	3	7	19	12	2	7	8.3	43.7	19	7	...	...	31	18	11	1	1	4
Perth Girls	14/2 to 10/3/24	...	96	...	76	...	16	...	24	...	60	...	8	...	8.33	...	22	...	55	68	...	34	...	...	16
Fremantle Infants	11-13/3/24	40	43	38	41	11	4	5	2	35	41	1	14	2.5	32.5	4	4	1	1	30	41	11	2	3	4
Princess May	27/2 to 3/3/24	...	104	...	85	...	16	...	43	...	73	...	27	...	26.0	...	32	...	28	92	...	14	...	...	26
Newcastle Street	11-25/3/24	43	49	39	40	10	10	11	9	31	34	3	8	7.0	16.3	3	1	8	12	23	33	23	14	...	3
Bicton	17-19/3/24	32	17	31	17	5	4	11	7	29	15	2	8	6.25	47.0	30	36	12	11	46	37	13	6	1	9
Palmyra	24-26/3/24	10	16	8	15	1	1	7	1	7	13	1	5	10.0	31.25	34	45	10	12	29	40	11	13	3	7
Richmond	8-9/4/24	21	14	17	13	4	2	2	3	16	10	1	5	4.7	35.6	10	13	15	22	16	20	14	5	1	2
Beaconsfield Infants	14-15/4/24	26	22	25	18	6	1	...	3	25	17	3	6	11.6	27.2	3	2	3	...	10	15	18	4	1	5
Beaconsfield Senior	15-28/4/24	39	35	38	27	13	7	14	15	33	21	4	9	10.2	26.5	3	3	8	17	20	21	20	8	2	9
East Fremantle Senior	30/4 to 2/5/24	42	35	41	32	5	10	23	17	34	25	1	8	2.4	23.0	4	8	11	15	24	28	19	5	3	10
East Fremantle Infants	6-8/5/24	31	31	26	29	7	7	5	3	23	26	2	6	6.4	19.3	3	1	12	3	26	23	7	5	1	4
White Gum Valley	19-21/5/24	33	39	30	36	10	5	13	14	26	33	3	15	9.09	38.4	2	1	3	7	12	21	23	14	...	4
North Fremantle Infants	22-23/5/24	22	17	21	16	4	4	3	2	19	15	3	4	13.6	23.5	1	2	2	3	12	10	11	6	...	3
North Fremantle Senior	27-28/5/24	28	31	25	26	3	5	16	11	21	24	3	9	10.7	29.0	...	2	11	9	9	15	18	13	1	5
Buckland Hill	2-6/6/24	31	36	27	34	2	7	12	13	22	28	1	10	3.2	27.8	2	...	9	5	27	26	6	5	...	5
Salvation Army Girls	5/6/6/24	...	85	...	60	...	13	...	20	...	43	...	...	...	...	...	...	...	...	...	55	...	...	...	5
Cottesloe Senior	10-11/6/24	36	36	32	30	7	5	13	17	25	22	1	3	2.6	8.3	...	3	18	17	22	21	14	14	2	4
Cottesloe Infants	13/6/24	30	23	23	21	6	3	4	1	19	21	...	4	...	17.4	1	3	4	3	19	17	11	4	1	5
North Cottesloe	19/6/24	16	8	10	7	2	1	3	2	10	5	...	...	...	...	1	1	2	2	11	4	5	2	...	2
Swanbourne	23-24/6/24	41	34	33	30	5	3	7	4	30	29	1	...	2.4	...	3	4	13	8	25	17	17	8	2	4
Graylands...	30/6/24	8	2	7	2	3	...	...	...	6	2	...	...	...	...	...	...	...	...	...	...	...	...	...	6
Claremont Senior	1/7/24	34	38	30	28	9	7	8	8	23	24	1	4	2.9	10.5	2	1	26	14	19	23	4	8	2	8
Claremont Infants	8/7/24	23	12	18	11	3	6	...	1	18	9	...	...	...	...	...	...	...	...	14	7	8	2	1	3
Claremont Practising	15-16/7/24	17	21	13	18	1	...	3	9	11	16	...	7	...	33.3	5	4	10	9	15	13	7	6	...	6
Fremantle Boys	17-22/7/24	106	...	88	...	13	...	43	...	69	...	2	...	1.8	...	19	...	16	...	65	...	45	...	15	...
East Cannington	28 and 29/7/24	19	14	15	12	2	1	5	6	14	12	...	4	...	20.5	39	26	5	4	28	31	27	5	2	5
Queen's Park Convent	4 and 5/8/24	12	13	9	12	...	...	4	4	9	11	...	2	...	15.3	27	28	...	...	21	24	11	12	5	4
Cannington	7, 12, 13/8/24	13	21	13	21	1	3	6	8	10	20	3	7	23.0	33.3	49	43	3	1	27	40	31	19	4	5
Queen's Park	30/7/24 to 1/8/24	12	10	10	10	1	...	3	3	4	9	...	1	...	10.0	40	40	2	1	23	35	28	7	...	6
Welshpool	14-15/8/24	4	2	3	2	1	...	...	...	2	2	...	1	...	50.0	12	11	...	...	12	11	4	...	...	2
Rivervale	19-20/8/24	24	14	23	13	4	4	7	5	23	11	3	...	12.5	...	35	23	3	4	27	17	21	12	10	8
Subiaco Infants	25-30/9/24	42	29	38	24	10	1	3	1	36	24	3	1	7.1	3.4	22	26	14	18	47	44	15	6	2	5
Subiaco Senior	1-3/4/24 and 23/9/24	53	53	41	36	9	8	17	13	35	30	2	12	3.7	22.6	7	14	10	13	27	40	24	16	8	8
Subiaco Intermediate	23/9/24	...	1	...	1	...	...	...	...	...	1	...	1	...	100.0	...	...	1	1	...	1	...	...	...	...

APPENDIX H.

MEAT INSPECTION, 1924.

[illegible]

Report of the Chief Inspector of Factories for the Year ended 31st December, 1923.

Legislation.

As in previous years the Department has been responsible for the administration of the following Acts:—

The Employment Brokers' Act, 1909,
The Shearers' Accommodation Act, 1912,
The Footwear Regulation Act, 1916,
The Factories and Shops Act, 1920, as amended,

whilst a considerable amount of inspection work is performed under the Industrial Arbitration Act, 1912.

The Factories and Shops Act Amendment Act No. 41 of 1923, was passed by Parliament during the year and was assented to on 22nd December, 1923.

This very important measure is designed to protect the health of and to secure safe working conditions for persons engaged in factories where white lead, red lead, litharge or other compounds of lead, mercurial or arsenical preparations are manufactured or produced, and requires the provision of washing and bathing conveniences, meal rooms elsewhere than in the factory, and masks and rubber gloves for the use of operatives.

Cases of lead or arsenical poisoning are notifiable, and the Governor is empowered to make regulations governing the conditions under which persons employed in factories where lead, arsenic, or other poisonous substance is used.

Staff.

Although there were some alterations in the personnel of the inspectorate during the year, the staff was not increased numerically. One inspector was appointed to the permanent staff, one temporary officer's services were dispensed with, and one inspector who had been on loan from the Health division returned to that division, so that at the end of the year the number of inspectors attached to the Factories Branch was one less than at the commencement, and comprised Chief Inspector, one Inspectress, and three Inspectors.

Inspection and Supervision.

The comparative table hereunder will show the number of inspections made under the Factories and Shops Act, 1920, for the three years 1921, 1922, and 1923:—

				1921.	1922.	1923.
Factories	...	...	...	3,642	3,948	4,185
Shops	...	...	...	5,489	7,371	4,015
Total	...	...	...	9,131	11,319	8,200

It will be noted that fewer inspections were made in 1923 than in the two previous years. This was due to the fact that during part of the year fewer inspectors were employed.

Statistics.

1. The increase in the number of factories registered was still maintained, although not to the same extent as for the two previous years. The increase this year is only 39 as against 292 and 276 for the years 1921 and 1922.

2. Reference to Schedule 1 will show that in 13 classes of industry the actual number of factories registered is less this year than for 1922, whilst 14 have more factories operating. In the industries relating to tanning, the number of establishments registered shows no movement, as is also the case in the item Miscellaneous.

3. The registrations of shops and warehouses for the year under review show an increase of 227 or 5,918 as compared with 5,691 for the previous year, and the returns indicate that at these 5,918 establishments there were 13,201 males, 8,226 females, or a total of 21,427 persons employed including principals, or an increase over the previous year of 1,560 persons. Only in the Goldfields districts does the total number of persons employed indicate a decrease, and this figure is 42 in 1,983.

4. During the year 389 suspensions were granted by the Minister under the provisions of Section 113 and Subsection 1 of Section 114 of the Act in respect of mixed businesses, or a total since the commencement of the Act, of 1,425. This class of shop necessitates careful and constant supervision in order to ascertain that the partitions are of a substantial nature, and that other conditions are maintained.

5. Section 104 of the Act provides for the issue of "Small Shop" certificates, entirely at the discretion of the Minister. The issue of these certificates is restricted to widows, old or physically disabled persons, in cases of great hardship, or if the shop and keeper thereof were previously registered under "The Early Closing Act, 1902." Careful inquiries into the merits or otherwise of each application are made before a recommendation is made.

6. The registration of a small shop is an annual one, whereas the suspension granted under Sections 113 and 114 has effect until there is a change in the occupancy of the shop, or unless withdrawn by the Minister. It will thus be seen that of the 5,918 shops and warehouses registered, 435 are described as "Small Shops" and 1,425 have been granted suspension under Sections 113 and 114, or about 20 per cent.

Revenue.

The revenue received from registrations of factories, shops, and warehouses, and also from fines and costs as a result of prosecutions is detailed hereunder:—

Source of Receipt.				1921.	1922.	1923.	Total.
				£ s. d.	£ s. d.	£ s. d.	£ s. d.
Registrations of Factories, Shops and Warehouses				1,498 12 0	1,789 10 9	1,762 14 9	5,050 17 6
Fines and Costs				74 6 4	315 4 0	*368 15 7	758 5 11
Total				1,572 18 4	2,104 14 9	2,131 10 4	5,809 3 5

* Representing £291 in fines and £77 15s. 7d. in costs.

Police Court Proceedings.

A total of 332 prosecutions were taken during the year 1923, as against a total of 314 for the year preceding.

A summary of the actions taken during 1923 is shown hereunder:—

No. of Cases.	Under Section.	Nature of Offence.
29	18	Occupying unregistered factory premises.
3	30 and 129	Failing to keep statutory records.
1	37	Females employed excessive overtime.
1	45	Paying less than the prescribed minimum wage.
1	75	Employing junior on management of elevator.
1	97	Displaying unstamped furniture for sale.
65	102	Shops (ordinary) open after prescribed closing time.
4	107	Chemists trading during prohibited hours.
25	108	Tobacconists trading during prohibited hours.
19	109	Hairdressers trading during prohibited hours.
1	112	Delivering goods after prescribed time.
17	117	Falling to close shop on proclaimed public holiday.
1	119	Employing assistant after hours.
2	125	Employing females for excessive hours.
162	133	Occupying unregistered shop premises.

As reported elsewhere fines amounting to £291 were imposed in respect to the above 332 cases, or an average of 17s. 6d., whilst the costs totalled £77 15s. 9d., or an average of 4s. 8d. per case.

Proclamations.

Since the Act has been in operation no less than 141 proclamations have been gazetted, of which the following is a summary:—

Proclamation relating to—	Total for year 1923.	Total from inception of the Act to 31/12/23
Substitution of a week-day, other than Saturday for the observance of the weekly half holiday in various shop districts.	2	34
Determining the day on which the late trading night should be observed in districts where such was permissible.	...	28
Temporarily suspending the provisions of the Act and exemptions.	2	18
Proclamation of holidays under Part VIII. of the Act.	7	18
Declaring certain goods to be appropriate to a specified class of shop.	1	1
Constitution of Shop Districts throughout the State and alteration of boundaries.	...	2
Regulations	...	5
Appointments in connection with Polls of electors and results of Polls.	...	33
	12	139

Polls of Electors.

Section 106 of the Act makes provision for the question as to which day in each week shall be observed as a half holiday, being referred to the electors for determination, and Section 102 permits of a poll of electors being taken to determine whether the late trading night shall be abolished.

No shop districts have availed themselves of these provisions during the year under review.

Premiums.

During the year only one case was reported of a breach of Section 46, which provides that no premium in respect of the employment of any person shall be paid to the occupier of a factory. A person who conducted a dressmaking establishment required the father of a girl employee, aged 19 years, to pay £20 as a premium for the employment of his daughter as an apprentice. The employer as soon as the irregular procedure had been brought to her notice, at once returned the amount paid, to the father of the girl.

The Employment Brokers' Act, 1909.

The number of employment brokers' licenses in operation during the year shows a decrease of one, as indicated by the table hereunder.

Comparative Statement of Licenses issued under Employment Brokers' Act.

Year.	DISTRICT.			Total Licenses issued for year.
	Perth.	Kalgoorlie.	Geraldton.	
1921 ...	12	2	1	15
1922 ...	12	2	1	15
1923 ...	12	1	1	14

The number of inspections made at licensed premises under this Act totalled 60 for the year. In all instances the books were kept in conformity with the requirements of the Act, and although they show that both employers and employees are charged fees ranging from a quarter to half the first week's wages, there is good reason to believe that whilst these fees are invariably collected from the employees, little effort is made to enforce payment from employers.

The Shearers' Accommodation Act, 1912.

In all 96 inspections of accommodation provided for shearers were made during the year. These inspections are made by officers of the Police Force who are appointed inspectors for the purposes of this Act.

From reports submitted it appears that the accommodation generally is of a satisfactory nature, and that in two instances new quarters had been rebuilt, and managers of one station contemplate the erection of new and up-to-date quarters.

Industrial Arbitration Act, 1912.

Investigations to the number of 54 were made in connection with matters under this Act, and as a result thereof employees benefited to the extent of £112 19s. 6d., which amount represents short payments under the terms of various awards and agreements.

A. C. BRADSHAW,
Chief Inspector of Factories.

SCHEDULE No. 1.

Classification for Factories, showing the various Branches of Industry, number of Factories in each Branch, also total number of males and females employed in the Perth, Suburban, Country, and Goldfields divisions of the State.

	Factories.					Employees.														
	1922.					1923.					1922.					1923.				
	Perth.	Suburban.	Country.	Goldfields.	Total.	Perth.	Suburban.	Country.	Goldfields.	Total.	M.	F.	Total.	Perth.		Suburban.		Country.		Total.
														M.	F.	M.	F.	M.	F.	
Clothing and shirtmaking, etc. ...	16	2	2	...	20	22	5	1	...	28	356	2,371	2,727	106	1,011	4	39	5	31	1,196
Tailoring ...	41	8	20	...	75	48	10	19	...	84	135	456	2,727	135	456	29	50	39	70	836
Dressmaking, Millinery, etc. ...	45	17	22	4	88	50	12	12	4	78	55	672	1,642	55	672	1	82	1	88	921
Processes in Stone, Clay, Glass etc. ...	19	30	7	2	58	18	30	6	1	55	1,604	38	1,642	395	61	915	34	98	...	1,452
Laundries and Dye Works ...	23	23	11	15	72	26	22	8	15	71	117	122	239	56	91	35	41	11	8	230
Bootmaking ...	16	6	1	1	24	16	8	1	1	26	...	...	...	209	91	24	3	...	...	332
Harness, Saddlery, leather goods	10	...	3	...	13	11	...	4	...	15	675	103	778	161	34	...	...	16	...	211
Tanning, Hides, skins, Wool, etc.	1	13	6	2	22	1	13	6	2	22	...	...	...	45	...	246	62	85	8	452
Aerated Waters and Cordials ...	17	17	49	16	99	21	17	48	16	102	84	2	...	78	9	84	2	122	...	335
Brewing and Bottling ...	13	4	9	2	28	12	4	3	2	21	347	20	...	347	20	56	1	31	1	521
Bakers and Pastrycooks ...	25	72	100	37	234	24	62	96	35	217	197	31	...	197	31	279	8	229	13	871
Confectionery, Condiments and Preserves	23	27	17	2	69	32	33	23	1	89	2,960	652	3,612	190	218	276	187	72	20	969
Abattoirs and Small goods	24	24	53	14	115	28	73	56	12	169	49	...	...	49	...	157	1	101	3	327
Icemaking and Cold Storage	1	7	2	3	13	2	5	2	1	10	52	4	...	52	4	69	1	21	1	152
Flour Mills	3	3	12	...	18	3	3	10	...	16	63	...	...	63	...	138	3	187	...	393
Blacksmiths, Wheelwrights, Coach-builders	16	9	33	6	64	22	17	33	4	76	203	5	...	203	5	66	2	17	...	310
Engineers and Foundries ...	24	21	14	9	68	24	16	12	12	64	544	5	...	544	5	2,790	6	146	1	3,623
Plumbing, Metal and Wireworking	20	9	4	1	34	17	7	4	2	30	235	49	4,575	235	30	86	2	37	1	398
Cycle and Motor Engineers	26	19	20	4	69	28	18	24	1	71	214	7	...	214	7	60	1	70	...	871
Electrical Engineers	12	1	...	...	13	11	2	...	1	14	162	1	...	162	1	44	...	...	...	211
Jewellery, Engraving, etc.	30	2	...	...	32	23	2	...	...	25	840	226	1,066	93	4	10	...	...	...	107
Printing, Photography	42	14	22	8	86	46	14	22	8	90	...	...	...	735	253	89	40	96	17	1,303
Furniture	38	23	...	2	63	44	22	...	2	68	463	16	...	463	16	208	10	...	...	701
Box and Casemaking	3	7	8	...	18	4	8	...	...	15	60	...	...	60	...	29	...	12	...	101
Framing, Carving, and Turning	4	4	...	...	8	5	2	3	...	9	29	...	...	29	...	17	...	17	...	63
Urban Saw and Joinery Mills	12	21	30	2	65	16	26	23	2	67	4,795	43	4,838	466	...	433	2	98	...	1,007
Forest Saw Mills	...	...	78	...	78	...	...	56	...	56	...	...	...	...	...	...	...	2,290	...	2,290
Woodyards	24	83	26	13	146	23	82	29	9	143	...	...	...	...	...	164	4	55	...	323
Miscellaneous	28	32	27	10	97	27	32	26	12	97	648	213	861	151	83	283	92	57	10	778
	556	498	576	159	1,789	604	545	529	150	1,828	16,521	3,817	20,338	5,564	3,015	6,592	673	3,916	274	20,770
																				20,770

SCHEDULE No. 2.

Comparison with previous years (1920-1921,) showing number of Factories registered ; number of males and females employed, with proportion of Juniors to Seniors in various groups of Industry.

	Factories.			Employees.						1923. Age and distribution of Juniors.						
	1921.	1922.	1923.	1921.			1922.			1923.						
				M.	F.	M.	F.	M.	F.	14-16.	17-18.	19-20.	15-16.	17-18.	19-40.	
Clothing Trades ...	151	183	190	333	2,244	356	2,371	398	2,545	22	18	6	441	518	320	
Stone, Clay, Glass, etc.	45	58	55	1,359	31	1,604	38	1,416	36	50	39	34	...	...	...	
Laundries ...	76	72	71	141	182	117	122	120	110	2	1	1	18	8	8	
Leather Trades ...	52	59	63	784	139	675	103	793	198	66	56	15	59	40	28	
Manufactured Foods and Drinks	516	576	624	2,470	475	2,960	652	3,052	536	127	114	71	101	121	82	
Metal Trades ...	231	280	280	4,365	44	4,526	49	5,096	68	221	254	230	2	12	5	
Printing, Photography, etc.	84	86	90	875	281	840	226	991	312	82	57	32	27	45	39	
Woodworking Trades ...	313	378	358	4,162	21	4,795	43	4,316	42	101	78	56	1	1	1	
Miscellaneous ...	75	97	97	591	200	648	213	593	185	64	39	26	25	29	14	
	1,543	1,789	1,828	15,080	3,683	16,521	3,817	16,775	4,032	735	656	471	674	774	497	

- (a) Net increase in number of factories since operation of 1920 Act—577.
(b) Net increase in number of males and females employed in same period—6,233.
(c) Percentage of junior males to males 21 years and over—1922, 12.25, 1923, 11.1.
Percentage of junior females to females 21 years and over—1922, 44.3, 1923, 48.2.
Total percentage of junior to senior employees—1922, 18.33, 1923, 18.9.

SCHEDULE No. 3.

Showing the number of Shops and Warehouses registered in the various Shop Districts, the number of Males and Females employed therein, and the number of Suspensions granted under Sections 113 and 114 for the years 1922 and 1923 respectively.

Name of District	No. of Shops. 1922.	Number of Employees. 1922			No. of Shops. 1923.	Number of Employees. 1923.			No. of Suspensions granted under Sec- tions 113 and 114.			No. of Small Shops registered under Sec- tion 104.	
		M.	F.	Total.		M.	F.	Total.	1922	1923.	1922.	1923.	
<i>Perth Division—</i>													
Perth City	1,537	4,865	3,225	8,090	1,643	5,410	3,519	8,929	77	142	148	155	
<i>Suburban Division—</i>													
Fremantle to Armadale and Bellevue	1,770	2,773	1,867	4,640	1,791	3,453	1,857	5,310	162	213	255	259	
<i>Country Division—</i>													
Albany Municipality	106	227	191	418	104	218	175	393	1	4	...	...	1
Bunbury Municipality	129	266	185	451	121	247	147	394	4	2	...	...	...
Busselton Municipality	30	43	52	95	36	60	58	118	...	2	...	...	...
Geraldton Municipality	116	263	162	425	116	278	175	453	1	3	...	...	1
Collie Municipality. ...	87	177	114	291	87	184	112	296	6	2	...	...	1
Narrogin Municipality	50	105	85	190	60	110	93	203	3	1	...	...	1
Northam Municipality	112	207	135	342	110	208	125	333	...	2	...	...	...
Wagin Municipality	49	99	55	154	46	105	59	164	...	...	...	...	1
York Municipality ...	44	91	67	158	43	82	73	155	...	1	...	...	...
Arthur, West	1	2	2	4	2	4	2	6	...	...	...	...	...
Augusta	1	1	...	1	2	2	...	2	...	...	...	...	...
Avon ...	12	20	8	28	18	33	16	49	...	...	...	...	...
Balingup	9	12	11	23	10	14	7	21	...	...	...	...	...
Beverley	26	44	38	82	26	47	34	81	1	...	...	...	...
Blackwood, Upper	16	19	13	32	14	13	7	20	...	...	...	...	...
Blackwood, Lower	6	10	2	12	9	11	5	16	...	...	...	...	...
Bridgetown ...	27	61	46	107	26	48	50	98	1	1	...	...	...
Brookton	17	23	18	41	15	23	15	38	...	...	...	...	...
Broomehill	5	10	3	13	5	12	4	16	...	...	...	...	...
Bruce Rock	28	57	25	82	33	60	39	99	...	1	...	...	...
Capel ...	...	...	...	...	5	9	8	17	...	...	...	...	...
Chittering	...	...	...	...	1	1	...	1	...	...	...	...	...
Corrigin	13	23	11	34	14	27	16	43	...	1	...	...	...
Cuballing	9	11	4	15	10	10	5	15	...	...	...	...	...
Dalwallinu	4	6	3	9	6	11	3	14	...	...	...	...	...
Dandarragan	...	...	...	...	1	1	...	1	...	...	...	...	...
Dardanup	2	3	...	3	1	1	...	1	...	...	...	...	...
Darling Range	11	14	15	29	14	19	13	32	1	2	...	...	3
Denmark	10	13	9	22	10	15	10	25	...	...	...	...	...
Dowerin	30	39	19	58	28	35	24	59	...	...	...	...	...
Drakesbrook	11	18	8	26	12	23	7	30	...	...	...	...	...
Dumbleyung	21	39	24	63	24	42	19	61	1	...	...	...	...
Esperance	7	10	10	20	7	16	6	22	...	...	...	...	...

SCHEDULE NO. 3—continued.

Showing the number of Shops and Warehouses registered in the various Shop Districts, the number of Males and Females employed therein, and the number of Suspensions granted under Sections 113 and 114 for the years 1922 and 1923 respectively—continued.

Name of District.	No. of Shops, 1922.	Number of Employees, 1922.			No. of Shops, 1923.	Number of Employees, 1923.			No of Suspensions granted under Sections 113 and 114.		Number of Small Shops registered under Section 104.
		M.	F.	Total.		M.	F.	Total.	1922.	1923.	
Gingin	4	4	3	7	5	6	5	11	...	...	...
Gnowangerup	14	22	21	43	15	23	1	24	...	2	...
Goomalling	18	32	15	47	14	28	12	40	...	...	...
Greenbushes	30	41	24	65	26	33	23	56	...	3	1
Greenmount	15	27	17	44	20	32	18	50	...	...	1
Harvey	30	52	26	78	34	59	31	90	...	...	...
Irwin ...	7	11	7	18	7	7	6	13	...	...	...
Katanning	43	123	89	212	46	129	77	206	...	1	...
Kellerberrin	36	69	27	96	40	63	31	94	...	...	...
Kojonup	15	20	14	34	14	18	13	31	...	...	...
Marradong	22	20	17	37	10	8	8	16	...	...	...
Meckering	30	60	39	99	40	64	32	96	...	...	...
Melbourne	5	9	4	13	6	9	5	14	...	1	...
Merredin	40	62	42	104	45	74	50	124	...	2	...
Mingenew	23	31	20	51	23	29	21	50	...	...	...
Moora ...	37	58	41	99	39	66	38	104	...	...	...
Mullewa	7	16	9	25	13	23	13	36	...	...	...
Murray	47	53	60	113	55	86	57	143	...	...	...
Ninghan	21	29	19	48	19	24	11	35	...	...	...
Northampton	21	31	21	52	20	29	23	52	...	...	...
Perenjori-Morowa	7	8	4	12	6	5	5	10	...	...	...
Phillips River	10	13	7	20	8	9	4	13	...	...	...
Pingelly	21	63	31	94	25	56	26	82	...	...	...
Plantagenet	18	31	21	55	26	42	21	63	...	1	...
Preston	22	33	28	61	21	31	26	57	...	...	...
Rockingham	...	...	...	...	5	12	13	25	...	...	...
Roe ...	5	5	4	9	16	22	12	34	...	2	...
Serpentine-Jarrahdale	14	20	18	38	21	29	20	49	...	...	...
Sussex	4	5	5	10	5	8	2	10	...	...	...
Swan ...	...	...	...	...	2	2	2	4	...	...	...
Tambellup	14	22	18	40	14	24	16	40	...	...	...
Toodyay	25	39	31	70	24	40	30	70	...	1	...
Victoria Plains	5	10	5	15	6	7	6	13	...	...	...
Warren	34	58	37	95	30	51	30	81	...	...	...
Westonia	15	15	7	22	8	13	5	18	...	...	...
Wickepin	25	33	15	48	26	37	24	61	...	...	...
Williams	5	6	6	12	4	7	5	12	...	...	...
Woodanilling	3	5	4	9	4	5	5	10	...	...	...
Wyalcatchem	10	19	9	28	17	21	13	34	...	...	...
Wanneroo	1	1	2	3	...	...	...	...	1	...	...
Total, Country Division	1,692	3,072	2,082	5,154	1,775	3,200	2,047	5,247	27	34	...
											11

Goldfields Division—

Kalgoorlie, Boulder, Brown Hill, Ivanhoe and Hannans	451	812	635	1,447	468	818	609	1,427	9	...	...	10
Coolgardie ...	20	22	12	34	21	22	25	47	...	...	...	...
Black Range ...	9	16	3	19	6	9	2	11	...	...	...	...
Broad Arrow ...	14	16	12	28	11	13	11	24	...	...	...	...
Cue-Day Dawn ...	15	28	10	38	16	27	7	34	...	...	...	...
Kanowna ...	1	1	1	2	1	1	1	2	...	...	...	...
Lawlers ...	5	9	3	12	8	11	7	18	...	...	...	...
Leonora-Malcolm ...	38	52	32	84	42	57	27	84	...	...	...	...
Meekatharra ...	25	44	22	66	19	34	18	52	...	...	...	...
Menzies ...	25	32	23	55	25	25	19	44	...	...	...	...
Mt. Magnet ...	12	22	12	34	18	25	17	42	...	...	...	...
Mt. Margaret ...	17	18	12	30	18	17	11	28	...	...	...	...
Nannine ...	2	4	1	5	2	2	2	4	...	...	...	...
Norseman ...	11	18	11	29	8	15	9	24	...	...	...	...
Wiluna ...	6	9	5	14	6	7	4	11	...	...	...	...
Yalgoo ...	13	17	12	29	12	18	15	33	...	...	...	...
Yilgarn ...	28	36	21	57	8	37	19	56	...	...	...	...
Total, Goldfields Division	692	1,156	827	1,983	709	1,138	803	1,941	10	...	...	10

SUMMARY OF SHOPS AND WAREHOUSES, EMPLOYEES, SUSPENSIONS, and REGISTERED SMALL SHOPS FOR THE TWO YEARS 1922 and 1923.

	No. of Shops. 1922.	Number of Employees, 1922.		No. of Shops. 1923.	Number of Employees, 1923.		No. of Suspensions granted under Sec- tions 113 and 114.		No. of Small Shops Registered under Sec- tion 104.	
		M.	F.		M.	F.	1922.	1923.	1922.	1923.
Perth ...	1,537	4,865	3,225	1,643	5,410	3,519	77	142	148	155
Suburban ...	1,770	2,773	1,867	1,791	3,453	1,857	162	213	255	259
Country ...	1,692	3,072	2,082	1,775	3,200	2,047	27	34	1	11
Goldfields ...	692	1,156	827	709	1,138	803	10	...	11	10
	5,691	11,866	8,001	5,918	13,201	8,226	276	389	417	435

Addendum to Report of Medical and Health Department, Western Australia, 1923-1924.

AN EXAMINATION OF DISINFECTANTS.

From the Laboratory of the Public Health Department, Perth, W.A.

By JOHN DALE, M.D., B.Sc. (Public Health), and J. G. C. CAMPBELL, B.Sc.

Summary.

The results which are embodied in this paper were obtained during an investigation of the germicidal powers of a number of proprietary disinfectants which were in use by various hospitals and Government Departments.

Most of the disinfectants examined were coal-tar preparations. A few experiments were carried out with chlorine.

The disinfectants were examined both chemically and bacteriologically.

The method of chemical analysis was the "Lancet" acetone-baryta method.

The bacteriological examinations were carried out under two sets of conditions: (1) with the organisms suspended in pure water; (2) with the organisms suspended in water containing ground faeces as recommended by Chick and Martin.*

In both cases the constant-time method was employed. The tests were carried out at a temperature of 22° C. The time of action of the disinfectants was 30 minutes. The organism used was a strain of *Bacillus coli communis*, which was grown in a standardised glucose-beef-extract-peptone broth.

The apparatus required is simple and the technique of the method is easy.

The coal-tar preparations were of two kinds, cresol-soap solutions, resembling lysol, which formed more or less clear solutions with water, and those which formed emulsions. The majority of the former contained approximately 50 per cent. of phenols, whilst the chemical analyses of the latter varied widely.

The bacteriological results obtained with those of the lysol group, which contained 50 per cent. of phenols, were very uniform, both in pure water and in presence of organic matter. Those which contained less than 50 per cent. of phenols yielded coefficients which corresponded closely with their phenol content.

The results obtained with the emulsifiers showed greater variations, corresponding only roughly with phenol content as discovered by chemical analysis.

The reduction of bactericidal power, or "depreciation," due to the presence of organic matter, was found to be fairly uniform in each group, to be larger for the "lysol" class than for carbolic acid, and very much larger in the case of the emulsifiers. In presence of 3 per cent. faeces the well-known brands of emulsifiers as a class gave practically the same coefficient as the lysol group.

A few experiments were made to show the effect of varying the amount of organic matter upon the strength of disinfectant required to sterilise in 30 minutes.

Some tests with 50 per cent. urine showed no obvious depreciation of efficiency as compared with that in pure water.

Blood serum in 50 per cent. concentration produced only a slight depreciation; pus, a more marked one.

Tests with chlorine showed a very high coefficient in pure water and a very great reduction thereof in the presence of 3 per cent. faeces. Nevertheless the coefficient in presence of 3 per cent faeces appears to be much greater than that of any of the coal-tar preparations.

The investigations described below were carried out during the year 1921. Under a system of calling for tenders for hospital and other supplies, it was found that disinfectants were offered under many names, some of which were new, and at prices which varied considerably even for substances of the same declared constitution and efficacy. It was decided, therefore, to obtain samples of the disinfectants available, to submit them for chemical analysis and to test their germ-killing power in the laboratory. As the outcome of a considerable amount of work, it has been possible to arrive at certain results which have proved of considerable assistance in connection with the buying of disinfectants, and have confirmed certain general conclusions already drawn by previous workers who have developed methods for their bacteriological examination.

In view of the large amount of work which was done and of the fact that the above-mentioned conclusions are not very generally known and accepted, it is felt that the work should be published.

Disinfectants examined.

In the following list the coal-tar preparations are grouped under two headings—(a) the emulsifying group, and (b) the non-emulsifying group.

Emulsifying group.—Bactox, Cyllin, Medical Cyllin, Hycol, Izal, Kerol, Zondo, and various so-called "Phenyles."

Non-emulsifying group.—Carbolacene, Creodol, Cresylone, Deodol, Felsol, Jeysol, Kresolvo, Lixal, Lysol (2), Sanitas Sypol and Zerol.

Chemical Examination.

The chemical examinations were carried out under the direction of the late Government Analyst, Mr. E. A. Mann, by Mr. F. J. Malloch, O.B.E., A.C.I., to both of whom we express our great obligation. The "Lancet" acetone-baryta method was adopted. In the case of Cyllin and Izal, it was necessary to modify the process slightly, owing to obscuring of the readings by the precipitation of the gums and gelatin they contained. The results of the analyses are given in Table No. 1.

TABLE No. 1.

Name.	Phenols or Phenoloids.	Carbolic acid equivalent by bromine.	Resins : Fatty acids.	Soda.	Potash.	Water.	Inert bodies hydrocarbon oils, etc. (by dif.)	Total neutral excipients.	Non-soapy or non-resinous emulsifiers.
	%	%	%	%	%	%	%	%	%
Creodol ...	53.36	34.50	20.50	...	2.88	22.60	...	45.98	...
Deodol ...	50.01	35.08	18.44	...	3.73	28.40	...	50.57	...
Felsol ...	47.28	32.01	16.61	...	3.60	33.00	...	53.21	...
Sanitas Sypol ...	51.10	34.18	21.01	...	2.14	24.58	...	47.73	...
Zerol ...	50.25	...	20.19	...	2.26	26.45	...	48.90	...
Lysol ...	36.15	21.93	23.53	...	3.42	36.14	...	63.09	...
Kresolvo ...	32.08	20.64	15.50	...	3.03	49.75	...	68.28	...
Lixal ...	9.84	6.07	4.73	...	1.19	84.96	...	90.88	...
Carbolacene ...	3.36	2.36	7.10	...	1.44	88.08	...	96.62	...
Bactox ...	32.17	17.49	13.65	...	1.48	6.22	46.48	67.83	...
Medical Cyllin ...	41.85	18.19	15.86	...	1.89	5.56	34.84	58.15	...
Cyllin ...	34.24	17.40	...	...	...	50.39	10.59	65.76	4.78 gums.
Hycol ...	30.87	18.31	14.42	...	2.14	7.60	44.97	69.13	...
Izal (old sample) ...	64.08	39.78	...	...	...	30.94	1.82	35.92	3.16 gelatin.
Izal (new sample) ...	63.52	39.50	...	...	...	31.64	1.73	36.48	3.11 gelatin.
Kerol ...	46.66	18.33	16.94	1.32	...	6.63	28.45	53.34	...
Zondo ...	29.47	16.65	15.80	...	1.75	7.53	45.45	70.53	...
Pearson's Hycol ...	33.07	17.25	19.13	...	2.83	4.70	40.27	66.93	...
"Tower" Brand Phenyle	22.45	15.40	17.71	...	2.32	10.63	46.89	77.55	...
"Gudoda" Phenyle	5.67	3.05	20.07	...	2.28	35.18	36.80	94.33	...

*Chick & Martin. Journal of Hygiene, Vol. VIII., p. 654, 1908.

Bacteriological Examination—Method.

Following the principles laid down by Chick and Martin, it was decided to test the various disinfectants both in pure water and in the presence of organic matter. In the early stages three sets of tests were carried out using sewage (sterilised septic-tank effluent) instead of the faeces suspension of Chick. The apparent effect of the sewage was to increase the efficacy of the disinfectant. The majority of the tests in the presence of organic matter were made, however, with dried faeces, a few, in addition, being carried out with urine, ox blood serum and pus.

As the "constant-time" method was used when testing the disinfectants in the presence of organic matter, it was considered advisable, for the purposes of comparison, to use the same method when testing in pure water.

In this method the variable factor is the amount of the disinfectant used. The constant factors are—

- (1) The time during which the disinfectant is allowed to act.
- (2) The temperature.
- (3) The kind and number of organisms upon which the disinfectant acts.

The time fixed was 30 minutes.

The temperature was maintained at 22° C. by keeping the tubes in racks in a water bath, which was kept in a Hearson's cool incubator. This worked fairly successfully, for despite the fact that the shade temperature rose above 100° F. on some 30 days during the exceptionally hot summer, the temperature of the water-bath, even on the hottest day, never passed 25° C.

The organism used was a strain of *Bacillus coli communis* which had been isolated from urine. The organism was sub-cultured on ordinary beef-peptone agar every two weeks. A sub-culture from this was made each day in the standard glucose broth described below, and was incubated at 37° C. for 24 hours. Before use the clumps in the culture were broken up by aspirating some of the fluid with a capillary pipette and forcibly ejecting it again into the remainder of the contents of the tube. The test tubes were inoculated with equal amounts of culture by means of a capillary pipette, the end of which was passed through the No. 19 hole of a standard wire gauge and cut off level. When this pipette was held vertically it delivered a drop of 0.02 c.c. Five drops, i.e. 0.1 c.c., were inoculated into each tube.

The medium on which the organism was grown was a glucose-meat-extract-peptone broth prepared as follows:—

"Bovril"	..	..	..	5 gm.
Peptone	..	..	..	10 gm.
Sodium chloride	..	..	..	5 gm.
Glucose	..	..	..	10 gm.

were dissolved in 1,000 c.c. of tap water by placing in the steamer for one hour. The reaction was adjusted to 6 (Eyre's scale), using phenolphthalein as an indicator. The medium was then filtered and tubed, 5 c.c. being placed in each tube, and the latter were sterilised in the autoclave for 10 minutes at 115° C. The tubes were stored in a jar with an air-tight lid to hinder evaporation.

For the test, tubes 4in. x 1in. were used. These were plugged and sterilised in the hot-air oven. Other requisites were pipettes of 1.0 c.c. capacity, graduated in one-hundredths. All apparatus was sterilised before use.

At the conclusion of the time allowed for each experiment a loopful of the disinfectant-organism mixture was withdrawn from each tube and inoculated into 10 c.c. of MacConkey's bile salt-lactose-litmus broth, which was incubated at 37° C. for 48 hours. The presence of living organisms was indicated by the acid reaction produced by the *B. coli* in this medium.

The same loop was used throughout the investigations. It was 4 m.m. in diameter, and was bent at right angles to the length of the wire and holder. In using the loop it was always kept vertical.

The disinfectants were made up with distilled water into 5 per cent. dilutions, which were used for direct addition to the tubes or were further diluted for the same purpose.

The dried faeces were prepared as follows: The stools of individuals on normal diet were dried at a temperature of 90-100° C. The dry mass was roughly powdered and further dried in the hot-air oven at 105° C. It was then finely powdered till it passed through a 120-mesh sieve. The powder was thoroughly mixed and weighed out into the tubes used for the test, 0.15 gm. being put into each. To each tube 2.5 c.c. of distilled water were then added, and they were sterilised by autoclaving at 110° C. for 10 minutes. They were then placed in an air-tight jar and stored in the ice-chest until required.

The actual technique of the test was as follows: The amount of water required to make a total of 5 c.c. was measured into each of the tubes, which were either empty or contained the suspension of faeces. Each tube was inoculated with five drops of the broth culture and thoroughly shaken to distribute the organisms. The varying amounts of disinfectant were then run into the tubes in succession, half a minute being allowed between each inoculation. The tubes were thoroughly shaken, and, as soon as all were treated, the racks were placed in the water-bath in the cool incubator. At the expiration of half an hour from the time when the disinfectant was added to the first tube, a loopful of the mixture was taken from the first tube and transferred to a tube of MacConkey's bile-salt-lactose-litmus broth. Half a minute later a loopful was taken from the second tube and inoculated into a second tube, and so on until the whole series had been dealt with. The disinfectant in each tube was thus allowed to act on the organisms for exactly 30 minutes.

Notes on the use of the Method.

Uniformity.—Each test had for its object to discover what is the minimum dilution of a given disinfectant which, within 30 minutes, at a temperature of 22° C., will so reduce a given number of standard organisms suspended in 5 c.c. of water, either pure or containing a uniform amount of organic matter, that a standard loopful of the mixture contains no living organisms. The result should be fairly comparable, and the same disinfectant should give the same result whenever tested.

But uniformity of conditions, however carefully sought, is only approximate, and in order to control it as far as possible a series of tubes containing a standard disinfectant was included in the experiment of each day.

A measure of uniformity of conditions and of accuracy of working is afforded within limits by the size of the gradations in strength of disinfectant, in the successive tubes of the control, with which constant results could be obtained.

The result aimed at in each test was that the organisms should survive in the tubes containing the smaller doses of disinfectant and be killed in those containing the greater doses. The protocol of such a test, called hereafter an "A" result, reads as follows, "x" indicating growth in the sub-culture, and "—" no growth:—

Tubes containing increasing amounts of disinfectants:

No. 1	x	x	x
No. 2	x	x	x
No. 3	x	or —	or x
No. 4	—	—	x
No. 5	—	—	—
No. 6	—	—	—

The result or end-point of the test was taken as a concentration midway between the largest which failed to kill and the smallest which succeeded.

A result obtained fairly frequently, especially with Carbolic Acid and in tests in the presence of organic matter, was as follows:—

Tube No. 1	x	x	x
Tube No. 2	x	—	x
Tube No. 3	—	x	x
Tube No. 4	x	or —	or —
Tube No. 5	—	—	x
Tube No. 6	—	—	—

This result is termed a "B" result. Though unsatisfactory it is not useless, as is evidenced by the fact that in 14 tests of Sanitas Sypol, in the presence of organic matter, nine "A" results gave an average "end-point" of 0.86 per cent., while five "B" results gave

an average of 0.87 per cent. Similarly in 10 tests of Carbolic Acid, in the presence of 3 per cent. faeces suspension, seven "A" results gave an average mid-point of 1.18 per cent., and three "B" results an average of 1.20 per cent. Again, the end-point was taken as the concentration midway between the highest which failed to sterilise and the lowest which succeeded.

If the difference between the amount of disinfectant in successive tubes were made very small, a third type of result is liable to occur, as is illustrated by the following:—

Tube No. 1	—	x
Tube No. 2	x	—
Tube No. 3	x	—
Tube No. 4	—	x
Tube No. 5	—	x
Tube No. 6	x	—

Such a result was, of course, discarded. It indicates either inaccuracy of working or that the difference between the amounts of disinfectants in successive tubes had been too small, *i.e.* smaller than the "uniformity" of conditions would warrant. With carbolic acid, for example, it was found that in a series of 12 tests in which the increase of strength from tube to tube was approximately 6 per cent., the proportion of failures was 25 per cent., whereas when the increase from tube to tube was about 3 per cent., the proportion of failures in 14 tests was 50 per cent.

It was, of course, necessary, as each new disinfectant came to be tested, to make a preliminary test, with wide intervals between the dilutions, in order to determine the approximate co-efficient. Thereafter the intervals were narrowed.

The average difference in concentration of disinfectant from tube to tube of a series is given in the tables below for each type.

Choice of a Standard.

Carbolic acid was first used as a standard for each day's tests. Pure phenol was distilled twice a week. The distillate was received into a weighing bottle, and, when solidified, consisted of white needle-shaped crystals with a melting point of 42° C. From this a fresh 5 per cent. solution was prepared each day.

The use of carbolic acid as a standard was therefore troublesome, and yielded, moreover, a relatively high proportion of failures. Better results were obtained by

the use of one of the "lysol" group as control. Sanitas sypol was the one chosen, though any other of similar chemical constitution would probably have served equally well. When testing in pure water, this control was used upon 19 occasions without any failures, and with only one result of the "B" type; whereas 23 carbolic acid controls gave 12 "A" results, 4 "B" results, and 7 failures.

Carbolic acid was used in the six tubes in the following percentage strengths: either 0.75, 0.80, 0.85, 0.90, 0.95 and 1.00, or 0.81, 0.84, 0.87, 0.90, 0.93, 0.96. Sypol was used in the following dilutions: 0.28, 0.31, 0.34, 0.37, 0.40 and 0.43 per cent.

In presence of faeces the usual percentage dilutions of carbolic acid were 1.05, 1.10, 1.15, 1.20, 1.25 and 1.30, and of sanitas sypol 0.75, 0.80, 0.85, 0.90, 0.95 and 1.0. Twelve tests with carbolic acid yielded 7 "A" results and 3 "B" results and 2 failures, whilst 15 with sanitas sypol gave 9 of "A" type, 5 of "B" type, and only one failure.

The variations in result of the two standards was about the same. In pure water 12 "A" results with carbolic acid varied from 0.82 per cent. to 0.92 per cent., the average being 88 per cent. Nineteen results with sanitas sypol—18 of "A" type and 1 of "B"—varied from 0.32 per cent. to 0.41 per cent, with an average of 0.36 per cent.

In presence of faeces 10 results with carbolic acid—7 of "A" and 3 of "B" type—varied from 1.15 per cent. to 1.35 per cent., whilst the 14 results with sanitas sypol—9 of "A", 5 of "B" type—varied from 0.77 per cent. to 0.97 per cent.

On the whole, it is claimed that the method is satisfactory and gives relatively uniform results. The apparatus required is simple and the technique is not difficult, as is shown by the fact that the early results were quite as uniform as those obtained after long practice. It is recommend that a disinfectant of the lysol class be used as a standard.

On several occasions since 1921 samples of disinfectants have been tested by the method. In each case a lysol preparation was used as control in the dilutions given above, and an "A" result of 0.37 per cent. or thereabouts was obtained.

Results.

The results obtained in the various tests of the examination are given in the table below:—

TABLE No. 2.

	Phenols or Phenoloids. Per cent. by analysis.	Average end-point in water.		Carbolic Acid Co-efficient in water.	Average end-point plus 3% faeces.		Carbolic acid Co-efficient plus 3% faeces.	Increase of strength necessitated by 3% faeces. End-point plus faeces divided by end point in water.
		Per cent.	No. of tests.		Per cent.	No. of tests.		
	A.	B.		C.	D.		E.	F.
Carbolic Acid	100.0 ?	0.88 Max. 0.92 Min. 0.82	(12)	1.0	1.19 Max. 1.35 Min. 1.15	(10)	1	1.4
<i>"Lysol" Group—Cresyl-soap solutions containing 50% phenols—</i>								
Creodol	53.36	0.38	(2)	2.3	0.87	(1)	1.4	2.3
Cresylone	...	0.35	(1)	2.5	0.78	(1)	1.5	2.2
Deodol	50.01	0.37	(3)	2.3	0.87	(1)	1.4	2.4
Felsol	47.28	0.37	(3)	2.4	...	...	...	...
Jeysol	...	0.34	(3)	2.6	...	...	...	...
Killgerm Lysol	...	0.32	(1)	2.7	...	...	...	...
Sanitas Sypol	51.10	0.36	(19)	2.4	0.87	(14)	1.4	2.4
Zerol	50.25	0.40	(2)	2.2	0.92	(2)	1.3	2.3
Commercial Cresylic Acid 50% plus soft soap	...	0.40	(2)	2.2	0.97	(1)	1.2	2.4
Ortho-cresol 50% plus soft soap	...	0.45	(3)	2.0	0.95	(1)	1.2	2.0
<i>Cresol-soap solutions with less than 50% phenols—</i>								
Lysol	36.15	0.55	(2)	1.6	1.27	(3)	0.9	2.3
Kresolvo	32.08	0.62	(2)	1.4	1.50	(2)	0.8	2.4
Lixal	9.84	1.80	(2)	0.5	...	...	...	...
Carbolacene	3.36	4.75	(2)	0.2	13.75	(1)	0.1	2.9
<i>Emulsifiers—</i>								
Bactox	32.17	0.10	(4)	9.1	0.70	(4)	1.7	7.0
Medical Cyllin	41.85	0.08	(3)	10.8	0.62	(1)	1.9	7.7
Cyllin	34.24	0.10	(1)	8.4	1.10	(1)	1.1	11.0
Hycol	31.97	0.11	(2)	8.0	0.75	(2)	1.6	6.8
Izal	63.8	0.12	(6)	7.3	1.02	(3)	1.2	6.8
Kerol	46.66	0.08	(2)	10.8	0.85	(1)	1.4	10.6
Zondo	29.47	0.13	(2)	6.5	1.10	(2)	1.1	8.5
<i>Phenyles—</i>								
Phenyle (Tower)	22.45	0.26	(2)	3.3	1.25	(1)	0.9	4.8
Phenyle (Gudoda)	5.67	0.55	(2)	1.6	5.30	(3)	0.2	9.6
Phenyle (S. Perth)	...	0.50	(1)	1.8	...	...	...	...
Phenyle (Perth)	...	0.65	(1)	1.3	7.0	(1)	0.2	10.8

In Table 2 the coal-tar disinfectants examined are grouped in four divisions—

1. A "lysol" group of cresol-soap solutions containing approximately 50 per cent. of "phenols."
2. Cresol-soap solutions containing less than 50 per cent. of "phenols."
3. A group of "emulsifiers"—mostly well-known brands of relatively high potency.
4. "Phenyles"—the term being a trade name applied to a group of emulsion-forming preparations, generally of low "phenol" content, low cost, and small bactericidal power. They are very extensively used in connection with the sanitary services (closet-pan removals) of the many Australian towns and villages which are not sewered.

The six columns of the table show—

- A. The percentage of "phenols" or "phenoloids" as ascertained by analysis.
- B. The percentage strength which was found to be the average "end-point" in pure water. The number of tests from which the average is computed is shown in brackets in the column.
- C. The carbolic acid co-efficient in pure water, calculated from the figures in column "B" by dividing that obtained for carbolic acid by that of each disinfectant.
- D. The average end-point in presence of 3 per cent. faeces, the number of tests being given in brackets.
- E. The carbolic acid co-efficient in presence of 3 per cent faeces, obtained from the figures in column "D" by dividing that of carbolic acid (in presence of 3 per cent faeces) by that of each disinfectant.
- F. A "depreciation-factor." The increase of strength necessitated by the presence of 3 per cent faeces; obtained by dividing the figure in column "D" by that in column "B"—
i.e., end-point in presence of 3 per cent. faeces divided by end-point in pure water.

The "Lysol" Group.—Cresol-soap solutions containing approximately 50 per cent. of phenols.

Several of these came to hand towards the end of the investigation and were not examined chemically.

The percentage dilutions generally used in the tests were: in pure water 0.21, 0.31, 0.34, 0.37, 0.40 and 0.43, and in presence of faeces 0.75, 0.80, 0.85, 0.90, 0.95, and 1.00.

The results obtained are fairly uniform. The end-points in pure water and in presence of 3 per cent. faeces fall, with one exception, within the range of variation of the control (Sanitas Sypol). The one exception was that of a solution which was made of ortho-cresol, kindly prepared for us by Professor Tattersall. This solution appeared to be distinctly less potent in pure water than the others of the group. Excluding the figures obtained for the two preparations, made by the writers, of commercial cresylic acid and of ortho-cresol, the average co-efficients of the group are 2.4 in pure water and 1.4 in presence of 3 per cent. faeces, and these figures coincide in each case with the co-efficient of the control, worked out from a relatively large number of tests.

Cresol-soap Solution containing less than 50 per cent. phenols.

There was nothing either in the advertisements or in the price of these to indicate clearly that they were of less potency than the lysol substitutes included in the first group.

Chemical examination showed, however, that the content of phenols varied from 36.15 to 3.36 per cent., and it is interesting to note that the carbolic acid co-efficients were approximately proportional thereto, as is shown in the following table No. 3, in which the figures in parentheses represent co-efficients calculated from the phenol content on the assumption that 50 per cent. of phenols gives co-efficients of 2.4 and 1.4 in pure water and in

presence of 3 per cent. faeces respectively, and that the co-efficient varies directly as the phenyle content:—

TABLE No. 3.

	Phenols.	Co-efficient	Co-efficient
	%	in water.	in presence of
			3% faeces.
"Lysol"	36	1.6 (1.7)	0.9 (1.0)
"Kresolvo"	32	1.4 (1.5)	0.8 (0.9)
Lixal	9.8	0.5 (0.5)	
Carbolacene	3.4	0.2 (0.2)	0.1 (0.1)

Emulsifiers.

The percentage dilutions generally used in the tests were: in pure water 0.03, 0.06, 0.09, 0.12, 0.15 and 0.18, and in presence of faeces 0.70, 0.75, 0.80, 0.85, 0.90, 0.95. It will be observed that in pure water the gradations of strength are relatively coarse, the increase from 0.03 to 0.06 being 100 per cent., and from 0.06 to 0.09, 50 per cent., and owing to this fact and the relatively small number of tests made the results are only to be considered as approximate. The co-efficients obtained vary considerably—from 6.5 to 10.8 in pure water, and from 1.1 to 1.9 in presence of faeces. It is quite possible—probable indeed—that certain of the preparations examined are more potent than others, but it would be unfair to draw any definite conclusions on the point from the figures given. The differences in chemical composition, as shown by analysis, do not correspond closely with the differences in either co-efficient, though it is apparent that those with the high phenol content have, in general, the higher co-efficients.

The average co-efficients of the group are, in water 8.4, and in presence of 3 per cent faeces 1.45, and it does seem justifiable to conclude that these are approximately correct under given conditions for the members of the group as a whole.

Phenyles.

The results of the tests with the four samples of this group showed that both in pure water and with faeces the one with the higher phenol content was decidedly more potent than the other three, which were uniformly weak in action, especially in presence of organic matter. It is interesting to note that they show the same average "depreciation-factor" as do the high-grade emulsifiers.

Depreciation-Factor.

In column "F" of Table 2 is given the figure which represents the increase of concentration necessitated by presence of 3 per cent. faeces. It is obtained by dividing the end-point in presence of 3 per cent. faeces by that obtained in presence of pure water, and represents the degree to which the potency of each disinfectant is depreciated by the presence of 3 per cent. faeces. It is called, therefore, the "depreciation-factor." It has already been pointed out by Chick, and is no doubt well recognised, that the depreciation of the emulsifying group is much greater than that of the "lysol" group. The figures in column "F" present several points of interest. It is to be noted that the figures for each group are fairly uniform. The depreciation-factor for carbolic acid is 1.4, considerably less than 2.4 which is the average for the whole of cresol-soap solutions, including those containing less than 50 per cent. of phenols. The figures for the emulsifiers are more variable, but the average for the group, 8.1, agrees closely with that of the phenyles, 8.4. The average figure for all the emulsion-forming preparations, namely 8.2, may justly be compared with the average for the "lysol" group and with that of carbolic acid.

It is curious that the average depreciation-factor for the whole of the cresol-soap solutions, viz., 2.4, coincides with the average co-efficients in water of the more powerful members of the group, whilst in the case of the emulsion-forming groups similar figures show a close correspondence, namely 8.2 and 8.4.

Effect of variation of concentration of organic matter.

Towards the end of the investigations a few experiments were made to show the effect of using varying amounts of organic matter. Sets of tubes were prepared containing 0.3, 0.15, 0.075 and 0.0375 gm. of dried faeces, which corresponded to concentrations of 6, 3, 1.5 and 0.75 per cent. of faeces in the 5 c.c. final content of the tubes.

Tests were made with one of the lysol group and with one of the more potent of the emulsifiers. The results are shown in Table 4, in which the figures represent the percentage strength of disinfectant which constituted the average "end-points" in each case, the number of tests from which the average is computed being shown in parentheses:—

TABLE 4.
Concentration of Faeces.

—	6%	3%	1.5%	0.75%
Cresol-soap solution ..	1.13 (2)	0.96 (2)	0.80 (3)	0.65 (2)
Emulsifier	0.85 (1)	0.57 (2)	0.46 (2)	0.38 (3)

The table serves to indicate the effect upon the "end-point" figures of doubling the concentration of organic matter, within the above limits. It is to be noted that in this series of tests the emulsifying disinfectant was decidedly more potent than the cresol-soap solution.

Experiments with Urine, Serum, and Pus.

A few tests were made in presence of urine, blood-serum, and pus. The urine was freshly passed and filtered, the serum was ox-blood serum, also filtered; and the pus taken from a large abscess and sterilised by pasteurisation.

In each instance the tubes contained 2.5 c.c. of the respective substances, the eventual concentration being, therefore, 50 per cent.

The results are shown in Table 5, in which the figures in parentheses indicate the number of tests upon which the average end-points are computed:—

TABLE 5.

Urine 50%	Creodol... 0.37% (2)	Bactox ... 0.12% (3)
Ox-blood serum... 50%	Creodol... 0.45% (1)	Izal ... 0.10% (2)
Pus 50%	Creodol... 0.52% (2)	Bactox ... 0.16% (2)
		Bactox ... 0.32% (4)

The results indicate that the urine caused no depreciation of potency as compared with that shown in pure water. In presence of blood-serum a slightly greater concentration of each type of disinfectant was required than in pure water, whilst the pus caused a depreciation of each, corresponding approximately to that due to the presence of 0.75 per cent. of faeces (Table 4).

Tests with Chlorine.

A few tests were made with chlorine. As no bleaching powder was purchasable with available chlorine content of more than 14 per cent., the gas was applied in the form of a fresh solution prepared from MnO₂ and HCL and in that of a solution of chloramine "T."

In the absence of organic matter the end-point of chlorine gas was found in the average of four tests to be approximately 0.00045 per cent., equal to a dilution of about one in 200,000, so that the carbolic acid co-efficient of Cl in water appears to be some 2000.

In presence of 3 per cent. faeces the average end point of three tests was approximately 0.05, equal to a dilution of 1 in 2000, and giving a co-efficient of 24. The depreciation-factor of chlorine seems, therefore, to be in the neighbourhood of 100, but the gas is nevertheless effective in

dilutions some ten or twenty times greater than those of the more powerful of the coal-tar series that were examined.

Discussion.

The constant-time method of testing disinfectants, as used by Chick and Martin, appears to us to be an easy and a satisfactory way of comparing the germicidal power of disinfectant solutions. The numerous tests (60) carried out by us with various cresol-soap solutions containing 50 per cent of cresols gave very uniform results, the solutions containing less than 50 per cent. were effective in proportion to their content of cresols, and the various emulsions behaved very much as their price, their makers' reputé, and the results of chemical analyses might lead one to expect. The tests with powdered excreta as organic matter were very valuable, as they emphasised the fact, already pointed out by Chick, that in its presence the germicidal power of the emulsions is reduced very much more than that of the solutions. We were surprised to find that under our conditions the emulsions of high advertised co-efficient were reduced to practically the same efficacy as the lysol group. Probably this important fact is still insufficiently recognised among users of disinfectants, who may be misled by statements based on tests carried out in the absence of organic matter. It is regrettable that no stability or toxicity tests were carried out with the various emulsions which we examined. We were not satisfied with the uniformity of the samples of dried excreta which we prepared. Probably the use of organic matter of more uniform composition, such as that prescribed in the British Admiralty test, would give more reliable results.

Our tests served to show that in some cases neither the cost nor the claims made in advertisements could be relied upon as a guide to the value of a disinfectant.

Conclusions.

1. Cresol-soap solutions are effective in proportion to their content of "phenols" as shown by chemical analysis.

2. The phenol or cresol content should be stated upon the label of such disinfectants.

3. The presence of organic matter (3 per cent. dried excreta) necessitates an increase of strength in the case of the various disinfectants in the following ratio:—

Pure carbolic acid	1.4
Cresol-soap solutions	2.4
Emulsions	8.2

4. By the use of the constant-time method of Chick and Martin, with *B. coli communis* as test-organism, the co-efficients of the coal-tar disinfectants were found to be as follows:—

In distilled water—	
Carbolic acid	1
Cresol-soap solution (50 per cent. cresol)	2.4
"High-power" emulsions (approx.) ..	8.4
In presence of 3 per cent. faeces—	
Carbolic acid	1
Cresol-soap solutions	1.4
"High-power" emulsions (approx.) ..	1.45

5. Chemical analysis gives only a rough indication of the relative efficacy of the emulsions.

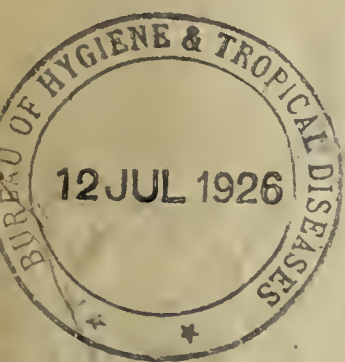
GOVERNMENT OF WESTERN AUSTRALIA.

Correspondents will greatly facilitate the transaction of their business by:

Confining each letter to one subject.
Writing on one side only of the paper.

DEPARTMENT OF PUBLIC HEALTH,

PERTH 11th June, 1926.



The Secretary,
Bureau of Hygiene and Tropical Diseases,
23 Endsleigh Gardens,
LONDON W.C.1
ENGLAND.

Dear Sir,

I beg to enclose herewith copy of a piece of work upon the testing of disinfectants which was carried out in this Department and published as an addendum to our last Annual Report. It may be of interest to the Editor of the Bulletin of Hygiene.

Copies have also been sent to the British Medical Journal and Lancet.

Under separate cover I am also forwarding a copy of the Milk Commission's Report, in case you have not seen it.

with Addendum

Yours faithfully,

John Hale

ENCL:
DA

DEPUTY COMMISSIONER OF PUBLIC HEALTH.

Ca



*Addendum to Report of Medical and Health
Department, Western Australia,
1923-1924.*

Addendum to Report of Medical and Health Department, Western Australia, 1923-1924.

AN EXAMINATION OF DISINFECTANTS.

From the Laboratory of the Public Health Department, Perth, W.A.

By JOHN DALE, M.D., B.Sc. (Public Health), and J. G. C. CAMPBELL, B.Sc.

Summary.

The results which are embodied in this paper were obtained during an investigation of the germicidal powers of a number of proprietary disinfectants which were in use by various hospitals and Government Departments.

Most of the disinfectants examined were coal-tar preparations. A few experiments were carried out with chlorine.

The disinfectants were examined both chemically and bacteriologically.

The method of chemical analysis was the "Lancet" acetone-baryta method.

The bacteriological examinations were carried out under two sets of conditions: (1) with the organisms suspended in pure water; (2) with the organisms suspended in water containing ground faeces as recommended by Chick and Martin.*

In both cases the constant-time method was employed. The tests were carried out at a temperature of 22° C. The time of action of the disinfectants was 30 minutes. The organism used was a strain of *Bacillus coli communis*, which was grown in a standardised glucose-beef-extract-peptone broth.

The apparatus required is simple and the technique of the method is easy.

The coal-tar preparations were of two kinds, cresol-soap solutions, resembling lysol, which formed more or less clear solutions with water, and those which formed emulsions. The majority of the former contained approximately 50 per cent. of phenols, whilst the chemical analyses of the latter varied widely.

The bacteriological results obtained with those of the lysol group, which contained 50 per cent. of phenols, were very uniform, both in pure water and in presence of organic matter. Those which contained less than 50 per cent. of phenols yielded coefficients which corresponded closely with their phenol content.

The results obtained with the emulsifiers showed greater variations, corresponding only roughly with phenol content as discovered by chemical analysis.

The reduction of bactericidal power, or "depreciation," due to the presence of organic matter, was found to be fairly uniform in each group, to be larger for the "lysol" class than for carbolic acid, and very much larger in the case of the emulsifiers. In presence of 3 per cent. faeces the well-known brands of emulsifiers as a class gave practically the same coefficient as the lysol group.

A few experiments were made to show the effect of varying the amount of organic matter upon the strength of disinfectant required to sterilise in 30 minutes.

Some tests with 50 per cent. urine showed no obvious depreciation of efficiency as compared with that in pure water.

Blood serum in 50 per cent. concentration produced only a slight depreciation; pus, a more marked one.

Tests with chlorine showed a very high coefficient in pure water and a very great reduction thereof in the presence of 3 per cent. faeces. Nevertheless the coefficient in presence of 3 per cent. faeces appears to be much greater than that of any of the coal-tar preparations.

The investigations described below were carried out during the year 1921. Under a system of calling for tenders for hospital and other supplies, it was found that disinfectants were offered under many names, some of which were new, and at prices which varied considerably even for substances of the same declared constitution and efficacy. It was decided, therefore, to obtain samples of the disinfectants available, to submit them for chemical analysis and to test their germ-killing power in the laboratory. As the outcome of a considerable amount of work, it has been possible to arrive at certain results which have proved of considerable assistance in connection with the buying of disinfectants, and have confirmed certain general conclusions already drawn by previous workers who have developed methods for their bacteriological examination.

In view of the large amount of work which was done and of the fact that the above-mentioned conclusions are not very generally known and accepted, it is felt that the work should be published.

Disinfectants examined.

In the following list the coal-tar preparations are grouped under two headings—(a) the emulsifying group, and (b) the non-emulsifying group.

Emulsifying group.—Bactox, Cyllin, Medical Cyllin, Hyeol, Izal, Kerol, Zondo, and various so-called "Phenyles."

Non-emulsifying group.—Carbolacene, Creodol, Cresylone, Deodol, Felsol, Jeysol, Kresolvo, Lixal, Lysol (2), Sanitas Sypol and Zerol.

Chemical Examination.

The chemical examinations were carried out under the direction of the late Government Analyst, Mr. E. A. Mann, by Mr. F. J. Malloch, O.B.E., A.C.I., to both of whom we express our great obligation. The "Lancet" acetone-baryta method was adopted. In the case of Cyllin and Izal, it was necessary to modify the process slightly, owing to obscuring of the readings by the precipitation of the gums and gelatin they contained. The results of the analyses are given in Table No. 1.

TABLE No. 1.

Name.	Phenols or Phenoloids.	Carbolic acid equivalent by bromine.	Resins: Fatty acids.	Soda.	Potash.	Water.	Inert bodies hydrocarbon oils, etc. (by dif.)	Total neutral excipients.	Non-soapy or non-resinous emulsifiers.
	%	%	%	%	%	%	%	%	%
Creodol ...	53.36	34.50	20.50	...	2.88	22.60	...	45.98	...
Deodol ...	50.01	35.08	18.44	...	3.73	28.40	...	50.57	...
Felsol ...	47.28	32.01	16.61	...	3.60	33.00	...	53.21	...
Sanitas Sypol ...	51.10	34.18	21.01	...	2.14	24.58	...	47.73	...
Zerol ...	50.25	...	20.19	...	2.26	26.45	...	48.90	...
Lysol ...	36.15	21.93	23.53	...	3.42	36.14	...	63.09	...
Kresolvo ...	32.08	20.64	15.50	...	3.03	49.75	...	68.28	...
Lixal ...	9.84	6.07	4.73	...	1.19	84.96	...	90.88	...
Carbolacene ...	3.36	2.36	7.10	...	1.44	88.08	...	96.62	...
Bactox ...	32.17	17.49	13.65	...	1.48	6.22	46.48	67.83	...
Medical Cyllin ...	41.85	18.19	15.86	...	1.89	5.56	34.84	58.15	...
Cyllin ...	34.24	17.40	...	...	...	50.39	10.59	65.76	4.78 gums.
Hyeol ...	30.87	18.31	14.42	...	2.14	7.60	44.97	69.13	...
Izal (old sample) ...	64.08	39.78	...	...	...	30.94	1.82	35.92	3.16 gelatin.
Izal (new sample) ...	63.52	39.50	...	...	...	31.64	1.73	36.48	3.11 gelatin.
Kerol ...	46.66	18.33	16.94	1.32	...	6.63	28.45	53.34	...
Zondo ...	29.47	16.65	15.80	...	1.75	7.53	45.45	70.53	...
Pearson's Hyeol ...	33.07	17.25	19.13	...	2.83	4.70	40.27	66.93	...
"Tower" Brand	22.45	15.40	17.71	...	2.32	10.63	46.89	77.55	...
Phenyle									
"Gudoda" Phenyle	5.67	3.05	20.07	...	2.28	35.18	36.80	94.33	...

*Chick & Martin. Journal of Hygiene, Vol. VIII., p. 654, 1908.

Bacteriological Examination—Method.

Following the principles laid down by Chick and Martin, it was decided to test the various disinfectants both in pure water and in the presence of organic matter. In the early stages three sets of tests were carried out using sewage (sterilised septic-tank effluent) instead of the faeces suspension of Chick. The apparent effect of the sewage was to increase the efficacy of the disinfectant. The majority of the tests in the presence of organic matter were made, however, with dried faeces, a few, in addition, being carried out with urine, ox blood serum and pus.

As the "constant-time" method was used when testing the disinfectants in the presence of organic matter, it was considered advisable, for the purposes of comparison, to use the same method when testing in pure water.

In this method the variable factor is the amount of the disinfectant used. The constant factors are—

- (1) The time during which the disinfectant is allowed to act.
- (2) The temperature.
- (3) The kind and number of organisms upon which the disinfectant acts.

The time fixed was 30 minutes.

The temperature was maintained at 22° C. by keeping the tubes in racks in a water bath, which was kept in a Hearson's cool incubator. This worked fairly successfully, for despite the fact that the shade temperature rose above 100° F. on some 30 days during the exceptionally hot summer, the temperature of the water-bath, even on the hottest day, never passed 25° C.

The organism used was a strain of *Bacillus coli communis* which had been isolated from urine. The organism was sub-cultured on ordinary beef-peptone agar every two weeks. A sub-culture from this was made each day in the standard glucose broth described below, and was inoculated at 37° C. for 24 hours. Before use the clumps in the culture were broken up by aspirating some of the fluid with a capillary pipette and forcibly ejecting it again into the remainder of the contents of the tube. The test tubes were inoculated with equal amounts of culture by means of a capillary pipette, the end of which was passed through the No. 19 hole of a standard wire gauge and cut off level. When this pipette was held vertically it delivered a drop of 0.02 c.c. Five drops, i.e. 0.1 c.c., were inoculated into each tube.

The medium on which the organism was grown was a glucose-meat-extract-peptone broth prepared as follows:—

"Bovril"	..	..	..	5 gm.
Peptone	..	..	..	10 gm.
Sodium chloride	..	..	..	5 gm.
Glucose	..	..	..	10 gm.

were dissolved in 1,000 c.c. of tap water by placing in the steamer for one hour. The reaction was adjusted to 6 (Eyre's scale), using phenolphthalein as an indicator. The medium was then filtered and tubed, 5 c.c. being placed in each tube, and the latter were sterilised in the autoclave for 10 minutes at 115° C. The tubes were stored in a jar with an air-tight lid to hinder evaporation.

For the test, tubes 4 in. x 1 in. were used. These were plugged and sterilised in the hot-air oven. Other requisites were pipettes of 1.0 c.c. capacity, graduated in one-hundredths. All apparatus was sterilised before use.

At the conclusion of the time allowed for each experiment a loopful of the disinfectant-organism mixture was withdrawn from each tube and inoculated into 10 c.c. of MacConkey's bile salt-lactose-litmus broth, which was incubated at 37° C. for 48 hours. The presence of living organisms was indicated by the acid reaction produced by the *B. coli* in this medium.

The same loop was used throughout the investigations. It was 4 m.m. in diameter, and was bent at right angles to the length of the wire and holder. In using the loop it was always kept vertical.

The disinfectants were made up with distilled water into 5 per cent. dilutions, which were used for direct addition to the tubes or were further diluted for the same purpose.

The dried faeces were prepared as follows: The stools of individuals on normal diet were dried at a temperature of 90-100° C. The dry mass was roughly powdered and further dried in the hot-air oven at 105° C. It was then finely powdered till it passed through a 120-mesh sieve. The powder was thoroughly mixed and weighed out into the tubes used for the test, 0.15 gm. being put into each. To each tube 2.5 c.c. of distilled water were then added, and they were sterilised by autoclaving at 110° C. for 10 minutes. They were then placed in an air-tight jar and stored in the ice-chest until required.

The actual technique of the test was as follows: The amount of water required to make a total of 5 c.c. was measured into each of the tubes, which were either empty or contained the suspension of faeces. Each tube was inoculated with five drops of the broth culture and thoroughly shaken to distribute the organisms. The varying amounts of disinfectant were then run into the tubes in succession, half a minute being allowed between each inoculation. The tubes were thoroughly shaken, and, as soon as all were treated, the racks were placed in the water-bath in the cool incubator. At the expiration of half an hour from the time when the disinfectant was added to the first tube, a loopful of the mixture was taken from the first tube and transferred to a tube of MacConkey's bile-salt-lactose-litmus broth. Half a minute later a loopful was taken from the second tube and inoculated into a second tube, and so on until the whole series had been dealt with. The disinfectant in each tube was thus allowed to act on the organisms for exactly 30 minutes.

Notes on the use of the Method.

Uniformity.—Each test had for its object to discover what is the minimum dilution of a given disinfectant which, within 30 minutes, at a temperature of 22° C., will so reduce a given number of standard organisms suspended in 5 c.c. of water, either pure or containing a uniform amount of organic matter, that a standard loopful of the mixture contains no living organisms. The result should be fairly comparable, and the same disinfectant should give the same result whenever tested.

But uniformity of conditions, however carefully sought, is only approximate, and in order to control it as far as possible a series of tubes containing a standard disinfectant was included in the experiment of each day.

A measure of uniformity of conditions and of accuracy of working is afforded within limits by the size of the gradations in strength of disinfectant, in the successive tubes of the control, with which constant results could be obtained.

The result aimed at in each test was that the organisms should survive in the tubes containing the smaller doses of disinfectant and be killed in those containing the greater doses. The protocol of such a test, called hereafter an "A" result, reads as follows, "x" indicating growth in the sub-culture, and "—" no growth:—

Tubes containing increasing amounts of disinfectants:

No. 1	x	x	x
No. 2	x	x	x
No. 3	x	or —	or x
No. 4	—	—	x
No. 5	—	—	—
No. 6	—	—	—

The result or end-point of the test was taken as a concentration midway between the largest which failed to kill and the smallest which succeeded.

A result obtained fairly frequently, especially with Carbolic Acid and in tests in the presence of organic matter, was as follows:—

Tube No. 1	x	x	x
Tube No. 2	x	—	x
Tube No. 3	—	x	x
Tube No. 4	x	or —	or —
Tube No. 5	—	—	x
Tube No. 6	—	—	—

This result is termed a "B" result. Though unsatisfactory it is not useless, as is evidenced by the fact that in 14 tests of Sanitas Sypol, in the presence of organic matter, nine "A" results gave an average "end-point" of 0.86 per cent., while five "B" results gave

an average of 0.87 per cent. Similarly in 10 tests of Carbolic Acid, in the presence of 3 per cent. faeces suspension, seven "A" results gave an average mid-point of 1.18 per cent., and three "B" results an average of 1.20 per cent. Again, the end-point was taken as the concentration midway between the highest which failed to sterilise and the lowest which succeeded.

If the difference between the amount of disinfectant in successive tubes were made very small, a third type of result is liable to occur, as is illustrated by the following:—

Tube No. 1	—	x
Tube No. 2	x	—
Tube No. 3	x	—
Tube No. 4	—	x
Tube No. 5	—	x
Tube No. 6	x	—

Such a result was, of course, discarded. It indicates either inaccuracy of working or that the difference between the amounts of disinfectants in successive tubes had been too small, *i.e.* smaller than the "uniformity" of conditions would warrant. With carbolic acid, for example, it was found that in a series of 12 tests in which the increase of strength from tube to tube was approximately 6 per cent., the proportion of failures was 25 per cent., whereas when the increase from tube to tube was about 3 per cent., the proportion of failures in 14 tests was 50 per cent.

It was, of course, necessary, as each new disinfectant came to be tested, to make a preliminary test, with wide intervals between the dilutions, in order to determine the approximate co-efficient. Thereafter the intervals were narrowed.

The average difference in concentration of disinfectant from tube to tube of a series is given in the tables below for each type.

Choice of a Standard.

Carbolic acid was first used as a standard for each day's tests. Pure phenol was distilled twice a week. The distillate was received into a weighing bottle, and, when solidified, consisted of white needle-shaped crystals with a melting point of 42° C. From this a fresh 5 per cent. solution was prepared each day.

The use of carbolic acid as a standard was therefore troublesome, and yielded, moreover, a relatively high proportion of failures. Better results were obtained by

the use of one of the "lysol" group as control. Sanitas sypol was the one chosen, though any other of similar chemical constitution would probably have served equally well. When testing in pure water, this control was used upon 19 occasions without any failures, and with only one result of the "B" type; whereas 23 carbolic acid controls gave 12 "A" results, 4 "B" results, and 7 failures.

Carbolic acid was used in the six tubes in the following percentage strengths: either 0.75, 0.80, 0.85, 0.90, 0.95 and 1.00, or 0.81, 0.84, 0.87, 0.90, 0.93, 0.96. Sypol was used in the following dilutions: 0.28, 0.31, 0.34, 0.37, 0.40 and 0.43 per cent.

In presence of faeces the usual percentage dilutions of carbolic acid were 1.05, 1.10, 1.15, 1.20, 1.25 and 1.30, and of sanitas sypol 0.75, 0.80, 0.85, 0.90, 0.95 and 1.0. Twelve tests with carbolic acid yielded 7 "A" results and 3 "B" results and 2 failures, whilst 15 with sanitas sypol gave 9 of "A" type, 5 of "B" type, and only one failure.

The variations in result of the two standards was about the same. In pure water 12 "A" results with carbolic acid varied from 0.82 per cent. to 0.92 per cent., the average being 88 per cent. Nineteen results with sanitas sypol—18 of "A" type and 1 of "B"—varied from 0.32 per cent. to 0.41 per cent, with an average of 0.36 per cent.

In presence of faeces 10 results with carbolic acid—7 of "A" and 3 of "B" type—varied from 1.15 per cent. to 1.35 per cent., whilst the 14 results with sanitas sypol—9 of "A", 5 of "B" type—varied from 0.77 per cent. to 0.97 per cent.

On the whole, it is claimed that the method is satisfactory and gives relatively uniform results. The apparatus required is simple and the technique is not difficult, as is shown by the fact that the early results were quite as uniform as those obtained after long practice. It is recommended that a disinfectant of the lysol class be used as a standard.

On several occasions since 1921 samples of disinfectants have been tested by the method. In each case a lysol preparation was used as control in the dilutions given above, and an "A" result of 0.37 per cent. or thereabouts was obtained.

Results.

The results obtained in the various tests of the examination are given in the table below:—

TABLE No. 2.

	Phenols or Phenoloids. Per cent. by analysis.	Average end-point in water.		Carbolic Acid Co-efficient in water.	Average end-point plus 3% faeces.		Carbolic acid Co-efficient plus 3% faeces.	Increase of strength necessitated by 3% faeces. End-point plus faeces divided by end-point in water.
		Per cent.	No. of tests.		Per cent.	No. of tests.		
	A.	B.		C.	D.		E.	F.
Carbolic Acid	100.0 ?	0.88 Max. 0.92 Min. 0.82	(12)	1.0	1.19 Max. 1.35 Min. 1.15	(10)	1	1.4
<i>"Lysol" Group—Cresyl-soap solutions containing 50% phenols—</i>								
Creodol	53.36	0.38	(2)	2.3	0.87	(1)	1.4	2.3
Cresylone	...	0.35	(1)	2.5	0.78	(1)	1.5	2.2
Deodol	50.01	0.37	(3)	2.3	0.87	(1)	1.4	2.4
Felsol	47.28	0.37	(3)	2.4	...	...	...	...
Jeysol	...	0.34	(3)	2.6	...	...	...	...
Killgerm Lysol	...	0.32	(1)	2.7	...	...	...	...
Sanitas Sypol	51.10	0.36	(19)	2.4	0.87	(14)	1.4	2.4
Zerol	50.25	0.40	(2)	2.2	0.92	(2)	1.3	2.3
Commercial Cresylic Acid 50% plus soft soap	...	0.40	(2)	2.2	0.97	(1)	1.2	2.4
Ortho-cresol 50% plus soft soap	...	0.45	(3)	2.0	0.95	(1)	1.2	2.0
<i>Cresol-soap solutions with less than 50% phenols—</i>								
Lysol	36.15	0.55	(2)	1.6	1.27	(3)	0.9	2.3
Kresolvo	32.08	0.62	(2)	1.4	1.50	(2)	0.8	2.4
Lixal	9.84	1.80	(2)	0.5	...	...	...	...
Carbolacene	3.36	4.75	(2)	0.2	13.75	(1)	0.1	2.9
<i>Emulsifiers—</i>								
Bactox	32.17	0.10	(4)	9.1	0.70	(4)	1.7	7.0
Medical Cyllin	41.85	0.08	(3)	10.8	0.62	(1)	1.9	7.7
Cyllin	34.24	0.10	(1)	8.4	1.10	(1)	1.1	11.0
Hycol	31.97	0.11	(2)	8.0	0.75	(2)	1.6	6.8
Izal	63.8	0.12	(6)	7.3	1.02	(3)	1.2	6.8
Kerol	46.66	0.08	(2)	10.8	0.85	(1)	1.4	10.6
Zondo	29.47	0.13	(2)	6.5	1.10	(2)	1.1	8.5
<i>Phenyles—</i>								
Phenyle (Tower)	22.45	0.26	(2)	3.3	1.25	(1)	0.9	4.8
Phenyle (Gudoda)	5.67	0.55	(2)	1.6	5.30	(3)	0.2	9.6
Phenyle (S. Perth)	...	0.50	(1)	1.8	...	...	...	...
Phenyle (Perth)	...	0.65	(1)	1.3	7.0	(1)	0.2	10.8

In Table 2 the coal-tar disinfectants examined are grouped in four divisions—

1. A "lysol" group of cresol-soap solutions containing approximately 50 per cent. of "phenols."
2. Cresol-soap solutions containing less than 50 per cent. of "phenols."
3. A group of "emulsifiers"—mostly well-known brands of relatively high potency.
4. "Phenyles"—the term being a trade name applied to a group of emulsion-forming preparations, generally of low "phenol" content, low cost, and small bactericidal power. They are very extensively used in connection with the sanitary services (closet-pan removals) of the many Australian towns and villages which are not sewered.

The six columns of the table show—

- A. The percentage of "phenols" or "phenoloids" as ascertained by analysis.
- B. The percentage strength which was found to be the average "end-point" in pure water. The number of tests from which the average is computed is shown in brackets in the column.
- C. The carbolic acid co-efficient in pure water, calculated from the figures in column "B" by dividing that obtained for carbolic acid by that of each disinfectant.
- D. The average end-point in presence of 3 per cent. faeces, the number of tests being given in brackets.
- E. The carbolic acid co-efficient in presence of 3 per cent faeces, obtained from the figures in column "D" by dividing that of carbolic acid (in presence of 3 per cent faeces) by that of each disinfectant.
- F. A "depreciation-factor." The increase of strength necessitated by the presence of 3 per cent faeces; obtained by dividing the figure in column "D" by that in column "B"—
i.e., end-point in presence of 3 per cent. faeces divided by end-point in pure water.

The "Lysol" Group.—Cresol-soap solutions containing approximately 50 per cent. of phenols.

Several of these came to hand towards the end of the investigation and were not examined chemically.

The percentage dilutions generally used in the tests were: in pure water 0.21, 0.31, 0.34, 0.37, 0.40 and 0.43, and in presence of faeces 0.75, 0.80, 0.85, 0.90, 0.95, and 1.00.

The results obtained are fairly uniform. The end-points in pure water and in presence of 3 per cent. faeces fall, with one exception, within the range of variation of the control (Sanitas Sypol). The one exception was that of a solution which was made of ortho-cresol, kindly prepared for us by Professor Tattersall. This solution appeared to be distinctly less potent in pure water than the others of the group. Excluding the figures obtained for the two preparations, made by the writers, of commercial cresylic acid and of ortho-cresol, the average co-efficients of the group are 2.4 in pure water and 1.4 in presence of 3 per cent. faeces, and these figures coincide in each case with the co-efficient of the control, worked out from a relatively large number of tests.

Cresol-soap Solution containing less than 50 per cent. phenols.

There was nothing either in the advertisements or in the price of these to indicate clearly that they were of less potency than the lysol substitutes included in the first group.

Chemical examination showed, however, that the content of phenols varied from 36.15 to 3.36 per cent., and it is interesting to note that the carbolic acid co-efficients were approximately proportional thereto, as is shown in the following table No. 3, in which the figures in parentheses represent co-efficients calculated from the phenol content on the assumption that 50 per cent. of phenols gives co-efficients of 2.4 and 1.4 in pure water and in

presence of 3 per cent. faeces respectively, and that the co-efficient varies directly as the phenyle content:—

TABLE No. 3.

	Phenols.	Co-efficient	Co-efficient
	%	in water.	in presence of 3% faeces.
"Lysol"	.. 36	1.6 (1.7)	0.9 (1.0)
"Kresolvo"	.. 32	1.4 (1.5)	0.8 (0.9)
Lixal ..	.. 9.8	0.5 (0.5)	
Carbolacene ..	.. 3.4	0.2 (0.2)	0.1 (0.1)

Emulsifiers.

The percentage dilutions generally used in the tests were: in pure water 0.03, 0.06, 0.09, 0.12, 0.15 and 0.18, and in presence of faeces 0.70, 0.75, 0.80, 0.85, 0.90, 0.95. It will be observed that in pure water the gradations of strength are relatively coarse, the increase from 0.03 to 0.06 being 100 per cent., and from 0.06 to 0.09, 50 per cent., and owing to this fact and the relatively small number of tests made the results are only to be considered as approximate. The co-efficients obtained vary considerably—from 6.5 to 10.8 in pure water, and from 1.1 to 1.9 in presence of faeces. It is quite possible—probable indeed—that certain of the preparations examined are more potent than others, but it would be unfair to draw any definite conclusions on the point from the figures given. The differences in chemical composition, as shown by analysis, do not correspond closely with the differences in either co-efficient, though it is apparent that those with the high phenol content have, in general, the higher co-efficients.

The average co-efficients of the group are, in water 8.4, and in presence of 3 per cent faeces 1.45, and it does seem justifiable to conclude that these are approximately correct under given conditions for the members of the group as a whole.

Phenyles.

The results of the tests with the four samples of this group showed that both in pure water and with faeces the one with the higher phenol content was decidedly more potent than the other three, which were uniformly weak in action, especially in presence of organic matter. It is interesting to note that they show the same average "depreciation-factor" as do the high-grade emulsifiers.

Depreciation-Factor.

In column "F" of Table 2 is given the figure which represents the increase of concentration necessitated by presence of 3 per cent. faeces. It is obtained by dividing the end-point in presence of 3 per cent. faeces by that obtained in presence of pure water, and represents the degree to which the potency of each disinfectant is depreciated by the presence of 3 per cent. faeces. It is called, therefore, the "depreciation-factor." It has already been pointed out by Chick, and is no doubt well recognised, that the depreciation of the emulsifying group is much greater than that of the "lysol" group. The figures in column "F" present several points of interest. It is to be noted that the figures for each group are fairly uniform. The depreciation-factor for carbolic acid is 1.4, considerably less than 2.4 which is the average for the whole of cresol-soap solutions, including those containing less than 50 per cent. of phenols. The figures for the emulsifiers are more variable, but the average for the group, 8.1, agrees closely with that of the phenyles, 8.4. The average figure for all the emulsion-forming preparations, namely 8.2, may justly be compared with the average for the "lysol" group and with that of carbolic acid.

It is curious that the average depreciation-factor for the whole of the cresol-soap solutions, viz., 2.4, coincides with the average co-efficients in water of the more powerful members of the group, whilst in the case of the emulsion-forming groups similar figures show a close correspondence, namely 8.2 and 8.4.

Effect of variation of concentration of organic matter.

Towards the end of the investigations a few experiments were made to show the effect of using varying amounts of organic matter. Sets of tubes were prepared containing 0.3, 0.15, 0.075 and 0.0375 gm. of dried faeces, which corresponded to concentrations of 6, 3, 1.5 and 0.75 per cent. of faeces in the 5 c.c. final content of the tubes.

Tests were made with one of the lysol group and with one of the more potent of the emulsifiers. The results are shown in Table 4, in which the figures represent the percentage strength of disinfectant which constituted the average "end-points" in each case, the number of tests from which the average is computed being shown in parentheses:—

TABLE 4.
Concentration of Faeces.

—	6%	3%	1.5%	0.75%
Cresol-soap solution ..	% 1.13 (2)	% 0.96 (2)	% 0.80 (3)	% 0.65 (2)
Emulsifier	0.85 (1)	0.57 (2)	0.46 (2)	0.38 (3)

The table serves to indicate the effect upon the "end-point" figures of doubling the concentration of organic matter, within the above limits. It is to be noted that in this series of tests the emulsifying disinfectant was decidedly more potent than the cresol-soap solution.

Experiments with Urine, Serum, and Pus.

A few tests were made in presence of urine, blood-serum, and pus. The urine was freshly passed and filtered, the serum was ox-blood serum, also filtered; and the pus taken from a large abscess and sterilised by pasteurisation.

In each instance the tubes contained 2.5 c.c. of the respective substances, the eventual concentration being, therefore, 50 per cent.

The results are shown in Table 5, in which the figures in parentheses indicate the number of tests upon which the average end-points are computed:—

TABLE 5.

Urine 50%	Creodol... 0.37% (2)	Bactox ... 0.12% (3)
		Izal ... 0.10% (2)
Ox-blood serum... 50%	Creodol... 0.45% (1)	Bactox ... 0.16% (2)
Pus 50%	Creodol... 0.52% (2)	Bactox ... 0.32% (4)

The results indicate that the urine caused no depreciation of potency as compared with that shown in pure water. In presence of blood-serum a slightly greater concentration of each type of disinfectant was required than in pure water, whilst the pus caused a depreciation of each, corresponding approximately to that due to the presence of 0.75 per cent. of faeces (Table 4).

Tests with Chlorine.

A few tests were made with chlorine. As no bleaching powder was purchasable with available chlorine content of more than 14 per cent., the gas was applied in the form of a fresh solution prepared from MnO_2 and HCL and in that of a solution of chloramine "T."

In the absence of organic matter the end-point of chlorine gas was found in the average of four tests to be approximately 0.00045 per cent., equal to a dilution of about one in 200,000, so that the carbolic acid co-efficient of Cl in water appears to be some 2000.

In presence of 3 per cent. faeces the average end point of three tests was approximately 0.05, equal to a dilution of 1 in 2000, and giving a co-efficient of 24. The depreciation-factor of chlorine seems, therefore, to be in the neighbourhood of 100, but the gas is nevertheless effective in

dilutions some ten or twenty times greater than those of the more powerful of the coal-tar series that were examined.

Discussion.

The constant-time method of testing disinfectants, as used by Chick and Martin, appears to us to be an easy and a satisfactory way of comparing the germicidal power of disinfectant solutions. The numerous tests (60) carried out by us with various cresol-soap solutions containing 50 per cent of cresols gave very uniform results, the solutions containing less than 50 per cent. were effective in proportion to their content of cresols, and the various emulsions behaved very much as their price, their makers' repute, and the results of chemical analyses might lead one to expect. The tests with powdered excreta as organic matter were very valuable, as they emphasised the fact, already pointed out by Chick, that in its presence the germicidal power of the emulsions is reduced very much more than that of the solutions. We were surprised to find that under our conditions the emulsions of high advertised co-efficient were reduced to practically the same efficacy as the lysol group. Probably this important fact is still insufficiently recognised among users of disinfectants, who may be misled by statements based on tests carried out in the absence of organic matter. It is regrettable that no stability or toxicity tests were carried out with the various emulsions which we examined. We were not satisfied with the uniformity of the samples of dried excreta which we prepared. Probably the use of organic matter of more uniform composition, such as that prescribed in the British Admiralty test, would give more reliable results.

Our tests served to show that in some cases neither the cost nor the claims made in advertisements could be relied upon as a guide to the value of a disinfectant.

Conclusions.

1. Cresol-soap solutions are effective in proportion to their content of "phenols" as shown by chemical analysis.

2. The phenol or cresol content should be stated upon the label of such disinfectants.

3. The presence of organic matter (3 per cent. dried excreta) necessitates an increase of strength in the case of the various disinfectants in the following ratio:—

Pure carbolic acid	..	..	1.4
Cresol-soap solutions	..	..	2.4
Emulsions	..	..	8.2

4. By the use of the constant-time method of Chick and Martin, with *B. coli communis* as test-organism, the co-efficients of the coal-tar disinfectants were found to be as follows:—

In distilled water—

Carbolic acid	..	..	..	1
Cresol-soap solution (50 per cent. cresol)	..	..	..	2.4
"High-power" emulsions (approx.)	..	..	..	8.4

In presence of 3 per cent. faeces—

Carbolic acid	..	..	..	1
Cresol-soap solutions	..	..	..	1.4
"High-power" emulsions (approx.)	..	..	..	1.45

5. Chemical analysis gives only a rough indication of the relative efficacy of the emulsions.

